22 (Endorsed:) Supreme Court U. S. October Term 1905. No. 19, original. The State of Washington, complainant, *vs.* State of Oregon. Answer of Defendant. Filed Feb'y 27, 1906.

23 And on the same day, to wit, on the 27th day of February, A. D. 1906, a stipulation was filed in the words and figures following, viz:

In the Supreme Court of the United States, October Term, A. D. 1905.

No. 19, Original.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Stipulation.

It is hereby stipulated by and between the parties hereto:

I.

That the answer of the State of Oregon and the answer of the State of Washington to any cross bill filed herein may be filed without the formality of verification by affidavit or certificate and seal of the State.

II.

That, upon the cause being put at issue, depositions may be taken by either party before an officer authorized to take depositions by the laws of the states of Washington or Oregon upon due notice to the adverse party, and if taken before an officer having an official seal, no other authorization will be required.

III.

That duly authenticated copies of any records, maps, or
24 official documents may be filed by either party with the clerk as evidence in the cause, upon furnishing to the adverse party copies thereof, subject to exception to their competency as evidence.

IV.

That the testimony in the cause shall be closed on or before the first Monday in August, 1906, unless for cause shown an extension of time shall be given.

SAMUEL H. PILES.
JOHN D. ATKINSON,
Attorney General.
E. C. MACDONALD,
Assistant Attorney General, Solicitors for Complainant.
C. W. FULTON,
Attorney for Defendant.

(Endorsed:) Supreme Court U. S. October Term 1905. No. 19, original. The State of Washington, complainant, *vs.* State of Oregon. Stipulation as to filing answer and as to taking testimony. Filed Feb'y 27, 1906.

25 And on the same day, to wit, on the 27th day of February, A. D. 1906, the following order was entered of record, viz:

Supreme Court of the United States, October Term, 1905.

No. 19, Original.

THE STATE OF WASHINGTON, Complainant,
vs.
THE STATE OF OREGON.

On consideration of the stipulation of counsel for the respective parties this day filed, It it now here ordered by the court that depositions may be taken by either party before an officer authorized to take depositions by the laws of the States of Washington or Oregon upon due notice to the adverse party, and if taken before an
26 officer having an official seal no other authorization will be required. It is further ordered that duly authenticated copies of any records, maps or official documents may be filed by either party with the Clerk as evidence in the cause, upon furnishing to the adverse party copies thereof, subject to exception to their competency as evidence. It is further ordered that the testimony in the cause shall be closed on or before the first Monday in August, 1906, unless for cause shown an extension of time shall be given.
February 27, 1906.

(Endorsed:) Supreme Court of the United States, October Term, 1905. No. 19, original. Order. Filed Feb. 27, 1906.

27 And afterwards, to wit, on the second day of April, A. D. 1906, a motion for leave to file replication was filed in the words and figures following, viz:

In the Supreme Court of the United States, October Term, A. D. 1905.

No. 19, Original.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Motion for Leave to File Replication.

Now comes the State of Washington, through John D. Atkinson, its attorney general, and E. C. Macdonald, its assist- attorney general,

and solicitors, and moves the court for leave to file a replication in the above entitled suit.

JOHN D. ATKINSON,
Attorney General.
E. C. MACDONALD,
Assistant Attorney General, Solicitors for Complainant.

SAMUEL H. PILES,
Of Solicitors for Complainant.

(Endorsed:) Supreme Court U. S., October Term, 1905. No. 19, original. State of Washington, complainant, *vs.* State of Oregon. Motion for leave to file Replication. Filed April 2d, 1906.

28 And on the same day, to wit, on the second day of April, A. D. 1906, the following entry appears of record, viz:

No. 19, Original.

THE STATE OF WASHINGTON, Complainant,
vs.
THE STATE OF OREGON.

On motion of Mr. S. H. Piles, in behalf of counsel for complainant, leave is hereby granted to file the replication of the Complainant herein.

And on the same day, to wit, on the second day of April A. D. 1906, the replication was filed in the words and figures following, viz:

29 In the Supreme Court of the United States, October Term, A. D. 1905.

No. 19, Original.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Replication.

To the Honorable the Chief Justice and Associate Justices of the Supreme Court of the United States:

The State of Washington, repliant, saving and reserving unto herself all advantage of exception to the insufficiencies of the answer of the State of Oregon herein, for replication thereunto says that she will aver and prove her bill of complaint in this cause to be true, certain and sufficient in the law to be answered unto, and that the said answer is uncertain, untrue and insufficient to be replied

to; all of which this repliant is and will be ready to aver and prove as this Honorable Court shall direct, and prays as in and by her said bill she has already prayed.

JOHN D. ATKINSON,
Attorney General,
E. C. MACDONALD,
Assistant Attorney General,
Solicitors for Complainant.

JOHN D. ATKINSON,
E. C. MACDONALD,
A. J. FALKNOR,
ROBERT F. BOOTH,
Of Counsel.
SAMUEL H. PILES,
Of Counsel.

30 UNITED STATES OF AMERICA,
Western District of Washington,
County of Thurston, ss:

John D. Atkinson, being first duly sworn, deposes and says that he is the duly elected, qualified and acting Attorney General of the State of Washington; that he has read the foregoing replication, knows the contents thereof and verily believes the same to be true.

JOHN D. ATKINSON.

Subscribed and sworn to before me this 8th day of March, A. D. 1906.

C. S. REINHART,
Clerk of the Supreme Court of the State of Washington.

(Endorsed:) Supreme Court U. S. October Term 1905. No. 19, Original. State of Washington, Complainant, *v.* State of Oregon. Replication. Filed April 2, 1906.

31 And afterwards, towit, on the 28th day of May, A. D. 1906, a motion for leave to file answer to cross-bill was filed in the words and figures following, viz:

In the Supreme Court of the United States, October Term, A. D. 1905.

Original, No. 19. In Equity.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Motion for Leave to File Answer to Cross-bill.

Now comes the State of Washington, through John D. Atkinson, its attorney general, and E. C. Macdonald, its assistant attorney

general, and solicitors, and moves the court for leave to file answer to cross-bill in the above entitled suit.

JOHN D. ATKINSON,
Attorney General,
SAMUEL H. PILES,
E. C. MACDONALD,
Assistant Attorney General,
Solicitors for Complainant.

(Endorsed:) Supreme Court U. S. October Term 1905. No. 19. Original. State of Washington, Complainant, *vs.* State of Oregon. Motion for leave to file answer to Cross Bill. Filed May 28, 1906.

32 And on the same day, towit, on the 28th day of May A. D. 1906, the following entry appears of record, viz:

No. 19, Original.

STATE OF WASHINGTON, Complainant,
vs.
STATE OF OREGON.

On motion of Mr. S. H. Piles, of counsel for complainant, leave is hereby granted to file the answer of the complainant to the cross-bill of the defendant.

And on the same day, towit, on the second day of May, A. D. 1906, the answer to cross-bill was filed in the words and figures following, viz:

33 In the Supreme Court of the United States, October Term, A. D. 1905.

Original, No. 19. In Equity.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Answer to Cross-bill.

To the Honorable the Chief Justice and Associate Justices of the Supreme Court of the United States:

Comes now the State of Washington, complainant herein, and for answer to the affirmative matter alleged in the answer of defendant herein and the cross-bill therein contained, says:

Denies that the true boundary line between your oratrix and defendant, insofar as the same is in controversy herein, is correctly delineated upon the map annexed unto the answer of defendant and marked "Exhibit 1;" but alleges the fact to be, that the true bound-

ary is correctly shown upon the maps attached to and made a par of the bill of complaint herein, and which your oratrix prays may be considered as a part of this answer to defendant's cross-bill, a fully to all intents and purposes as if here reproduced.

Denies that all or any of the islands or sands mentioned in the complaint, or answer and cross-bill herein, are south of the true boundary line between your oratrix and defendant as defined by act of congress, or are wholly, or at all, within the territorial jurisdiction or under the sovereignty, of the defendant.

34 Denies that any or all islands or sands, whether or not expressly named, situate, lying or being in the waters of the Columbia river south of the pretended boundary line, as delineated on the maps annexed to the defendant's answer, are within the territorial jurisdiction, or under the dominion, or sovereignty, of defendant, or subject to its laws; or that defendant has continuously, or at all, exercised jurisdiction over the same since her admission into the union; save and except as to those islands and sands which are south of the true boundary line between said states as delineated upon the maps annexed to the bill of complaint herein.

Wherefore, your oratrix prays that upon final hearing of this cause the boundary line herein claimed may be ascertained and established by the decree of this court; that the rights of possession, jurisdiction and sovereignty of your oratrix thereto be quieted, and the defendant forever enjoined and restrained from disturbing your oratrix, her officers or people, in the full possession of the same; and for such other and further relief as to the court may seem meet and consistent with equity and good conscience.

And your oratrix will ever pray.

JOHN D. ATKINSON,
Attorney General,
E. A. MACDONALD,
Assistant Attorney General,
Solicitors for Complainant.

SAMUEL H. PILES,
A. J. FALKNOR,
ROBERT F. BOOTH,
Of Counsel.

35 UNITED STATES OF AMERICA,
Western District of Washington,
County of Thurston, ss:

John D. Atkinson, being first duly sworn, deposes and says that he is the duly elected, qualified and acting Attorney General of the State of Washington; and as such is authorized to pray leave to file this answer to Cross-Bill; that he has read the same, knows the contents thereof and that the same is true as he verily believes.

JOHN D. ATKINSON.

Subscribed and sworn to before me this 14th day of May, A. D. 1906.

C. S. REINHART,
Clerk of the Supreme Court of
the State of Washington.

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(Endorsed:) Supreme Court U. S. October Term 1905. No. 19, original. State of Washington, complainant, *vs.* State of Oregon. Answer to Cross Bill. Filed May 28, 1906.

36 And afterwards, to wit, on the 16th day of October, A. D. 1906, an order for appearance for defendant was filed in the words and figures following, viz:

Order for Appearance.

Supreme Court of the United States.

No. 6, Orig'l, October Term, 1906.

STATE OF WASHINGTON, Complainant,
vs.
STATE OF OREGON.

The clerk will enter my appearance as counsel for the defendant.

(Name) A. M. CRAWFORD,
(P. O. Address) *Salem, Oregon.*

NOTE.—Must be signed by a member of the Bar of the Supreme Court United States. Individual and not firm names must be signed.

(Endorsed:) Supreme Court U. S. October Term 1906. No. 6, Original. Appearance for defendant. Filed Oct. 16, 1906.

37 And afterwards, to wit, on the 5th day of November, A. D. 1906, an order for appearance for complainant was filed in the words and figures following, viz:

Order for Appearance.

Supreme Court of the United States.

No. 6, Orig'l, October Term, 1906.

STATE OF WASHINGTON, Complainant,
vs.
STATE OF OREGON.

The clerk will enter my appearance as counsel for the complainant.

(Name) M. J. GORDON,
(P. O. Address) —— ——.

NOTE.—Must be signed by a member of the Bar of the Supreme Court United States. Individual and not firm names must be signed.

(Endorsed:) Supreme Court U. S. October Term 1906. No. 6, original. Appearance for complainant. Filed Nov. 2, 1906.

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38 And on the same day, to wit, on the 5th day of November A. D. 1906, a motion for leave to publish depositions &c. was filed in the words and figures following, viz:

In the Supreme Court of the United States, October Term, A. D. 1905.

No. 6, Original.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Motion for Leave to Publish Depositions.

Comes now the State of Washington and moves the Court for an order publishing the depositions herein and directing the printing thereof.

Complainant further moves that the original plats and maps introduced in evidence may be received in evidence and considered without being reprinted.

E. C. MACDONALD,
M. J. GORDON,
Solicitors for Complainant.

(Endorsed:) Supreme Court U. S. October Term 1906, No. 6 Original. State of Washington, complainant, *vs.* State of Oregon. Motion to publish testimony and that plats and maps be not reproduced. Filed Nov. 5, 1906.

39 And on the same day, to wit, on the 5th day of November A. D. 1906, the following entry appears of record, viz:

No. 6, Original.

STATE OF WASHINGTON, Complainant,
vs.
STATE OF OREGON.

On motion of Mr. M. J. Gordon, of counsel for the complainant, it is now here ordered by the Court that the depositions herein be opened, published and filed, and that the original maps and plats be considered without being reprinted.

And on the same day, to wit, on the 5th day of November, A. D. 1906, the testimony for both parties was filed in the words and figures following, viz:

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40 In the Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Oath of Commissioner.

STATE OF OREGON, *County of Clatsop, ss:*

I, C. C. Dalton, do solemnly swear that I will support the constitution and laws of the United States and will faithfully and impartially discharge the duties devolving upon me as commissioner on the part of the State of Washington in the above-entitled cause. So help me God.

(Signed) C. C. DALTON.

Subscribed and sworn to before me this 11th day of July A. D. 1906.

J. C. CLINTON,
County Clerk of Clatsop County, State of Oregon, and Ex-officio Clerk of the Circuit Court for Said County.

[SEAL.]

41 In the Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Oath of Commissioner.

STATE OF OREGON, *County of Clatsop, ss:*

I, John W. Reynolds, do solemnly swear that I will support the constitution and laws of the United States and will faithfully and impartially discharge the duties devolving upon me as commissioner on the part of the State of Oregon in the above-entitled cause. So help me God.

(Signed) JOHN W. REYNOLDS.

Subscribed and sworn to before me this 11th day of July, A. D. 1906.

J. C. CLINTON,
County Clerk of Clatsop County, State of Oregon, and Ex-officio Clerk of the Circuit Court for Said County.

[SEAL.]

42 Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Record of Testimony on Behalf of State of Washington.

Now, on this 16th day of July, 1906, in pursuance of the stipulation of the parties hereto filed herein, and by mutual agreement of the parties, the taking of testimony on behalf of the complainant in the above-entitled cause was commenced at "The Breakers," Pacific County, State of Washington, before Hon. C. C. Dalton, Commissioner on the part of the State of Washington, and Hon. John W. Reynolds, Commissioner on the part of the State of Oregon;

Counsel on the part of the complainant being E. C. Macdonald, Assistant Attorney General of the State of Washington, and John T. Welsh;

Counsel on the part of the defendant being Hon. A. M. Crawford, Attorney General of the State of Oregon; U. S. Senator Charles W. Fulton; Harrison Allen, District Attorney of the Fifth Judicial District, State of Oregon, and C. H. Abercrombie, Deputy District Attorney of the Fifth Judicial District, State of Oregon.

Robert S. Taylor was sworn to truly, faithfully and correctly report in shorthand writing and transcribe into typewriting the testimony and proceedings.

Thereupon the following proceedings were had and the following testimony introduced:

Mr. MACDONALD: I desire to introduce in evidence certain portions of "Annual Report upon the Improvement of Rivers in Oregon and Washington Territory, in Charge of John M. Wil-
43 son, Major of Engineers, B'v't Colonel, U. S. A. being Appendix J. J. of the Annual Report of the Chief of Engineers for 1877." I desire to introduce from that report only the following paragraph, which is found on page 1003, entitled: "Survey of Sand Island, Mouth of Columbia:

"The annual survey of Sand Island was made in May 1877, and showed an erosion of about 200 feet on the weather face and again of from 200 to 400 feet on the lee face since the survey of 1876; this island has moved about 1800 feet, nearly, due north in the last nine years, its superficial area remaining about the same and its depth being slightly changed."

The volume from which the above extract was offered and read was marked "Washington's Exhibit B," and signed by the Commissioners.

Mr. MACDONALD: I desire the record to show that the excerpt from which I have just read is contained in the official Report of Major John M. Wilson, Corps of Engineers, U. S. Army, and in

regular course transmitted to the Chief of Engineers of the U. S. Army to the Secretary of War and to Congress.

This offer was objected to by defendant as being incompetent and hearsay testimony.

Mr. MACDONALD: I desire to offer in evidence pages 2, 3, 4, 5, 6, 7, 8, 9, and 10 of Senate Executive Document No. 13, 47th Congress, 2nd Session, being a report of the Board of Engineers for the permanent Improvement of Mouth of Columbia River, Oregon;
44 dated San Francisco, Cal., October 13, 1882, and transmitted by the Board to the Chief of Engineers U. S. Army, and by the Chief of Engineers transmitted to the Secretary of War on December 11, 1882, and on December 14, 1882, transmitted by the Secretary of War to the President of the United States Senate.

I also offer from the same document page 14, entitled "Locations and depths of channels at times of different surveys."

I also offer from the same document "Report of Examination of Bar, Mouth of Columbia River, by Lieut. P. M. Price, Corps of Engineers," dated Astoria, Oreg., May 31, 1882, found on page 19 thereof.

I also offer from the same document maps No. 2 and No. 3.

I do not desire to introduce in evidence the remainder of the document as I deem the same immaterial.

I do not desire at this time to offer pages 11, 12 and 13 of said document because this information will be offered from another report at a later date.

Said document was marked Washington's Exhibit C and signed by the Commissioners.

Mr. MACDONALD: Let the record show that the last two Exhibits offered in evidence are duly authenticated by the Chief of Engineers U. S. Army and by the Acting Secretary of War, under the seals of their respective departments; and I wish the Commissioners would mark also the particular maps which I have offered.

Pages 2, 3, 4, 5, 6, 7, 8, 9, and 10 of Washington's Exhibit C are as follows:

Report of the Board of Engineers for the Permanent Improvement of Mouth of Columbia River, Oregon.

SAN FRANCISCO, CAL., *October* 13, 1882.

The Board of Engineers constituted by paragraph 2 of
45 Special order No. 82, Headquarters Corps of Engineers, August 18, 1882, "to examine in detail the mouth of the Columbia River, Oregon, and report such plan with estimates for its permanent improvement as they approve," has the honor, after making a personal examination of the mouth of the river, and a full conference with pilots and others familiar with it, and after special consideration of commercial statistics as presented by the Boards of trade of Astoria and Portland, to submit the following report.

The Columbia River enters the Pacific Ocean between Cape Disappointment (Hancock) and Point Adams. The former is a rocky

headland of about 200 feet in height, and the latter a low, changeable, sandy point, 6 miles distant in a south-southeast direction. Taking this line as part of a chord, the curve of 30-foot* depths outside of the bar is convex toward the sea, and its vertex is about 4½ miles outside of this chord.

Inside of this 30-foot curve the water shoals rapidly to a sandy cordon, having on it, for large portions of its length, depths of water varying from 2 or 3 to 12 or 15 feet, but having channels through it which sometimes have reached 27 feet in depth. The depths in the channels and on the sands intervening vary widely at different times. The length of this cordon, measured on the exterior 30-foot curve, is about 12 miles.

From Point Adams a broad, sandy spit, called Clatsop Spit, runs to the northwest the vertex of its 18-foot curve being 3 miles from Point Adams. A similar spit, called Peacock Spit, runs from Cape Disappointment 1¼ miles to the southwest.

Inside of the sandy cordon the river is an estuary for 26 miles, varying in width between 3 and 9 miles; it then becomes an ordinary river of about a mile in width.

The low-water cross-section of the river between Point Adams and Chinook Point is about 420,000 square feet, and the width
46 3½ inches. This section seems to be stable, as it has varied little in the last forty-one years.

Between this section and the sand cordon an island called Sand Island is shown on the chart of 1839, and on all subsequent ones. It has undergone great variations in form and position, and has had its influence on the depths of channels. It will be adverted to hereafter.

An examination of the general chart of the coast shows a narrow sand spit running north for 25 miles, from the general headland of which Cape Disappointment is a part, to the entrance of Shoalwater Bay, and separating this bay from the ocean. On the south side of the mouth of the river, near Point Adams, the sand point is 1½ miles wide, and it continues as a sand beach for 17 miles southward to Tillamook Head where it disappears. The prolongation of both of these sandy points to the northward seems to indicate that the prevailing motion of the sands is in that direction, although this does not seem to be the case at all points on the coast of Oregon and California.

Off the mouth of the river the curves of equal depth show a bend seaward to the 20 fathom curve, where the bend disappears. The soundings increase at the rate of about 30 feet to the mile, reaching 300 feet 11 miles west of Cape Disappointment. Beyond a depth of about 10 fathoms, mud is shown on the chart in some places, and as there is much evidence that the sea sometimes breaks in this depth is supposed to be about the limit of depths at which the sea acts effectively on the sands.

The Coast Survey chart of the approaches to the Columbia River, 1878, states that 8 or 10 miles off the coast there is a current whose

*All depths refer to low-water unless the contrary is stated.

direction depends on that of the prevailing winds, being
47 northerly in winter and southerly in summer. The season of storms is from November to April; They are called southeasters. The wind beginning in the southeast veers to the south and southwest, the storm ceasing when the wind gets around to the northwest. Sometimes storms are almost continuous for many days; They are accompanied and followed by an extreme heavy sea from the southwest; which often renders the bar unsafe or impracticable. Steam vessels are occasionally detained inside the bar for a week without daring to cross out. During winter and spring there is in some years a good deal of northeast wind, with cold weather. The river occasionally freezes below Portland. The summer wind is from the northwest. It is generally a good sailing breeze, although it sometimes increases to a moderate gale.

There are two tides daily, of unequal height, except when the moon's declination is zero, when they are equal. The mean rise and fall at Astoria is 6.1 feet. At low stages of the river the tide is perceptible for 150 miles above its mouth, and at that time the average tidal flow at the mouth for the six hours between the lower low-water and the higher high-water is estimated at about 1,000,000 cubic feet per second. As the tidal flow starts from zero, passes through a maximum and returns again to zero, its maximum value may be taken roughly as 2,000,000 cubic feet per second.

The fresh-water discharge of the river, at low stage, is estimated at about 90,000 cubic feet per second; at mean stage at 30,000, and in great floods at 1,000,000. As these great floods are not of long duration, it is evident that the tidal flow is much more important in its action at the mouth of the river than the river discharge proper.

At low stages of the river its water is clear and almost
48 entirely free from sediment, and the local engineer is of the opinion that the amount carried at high stages is not large. Pilots state that in floods muddy water is seen 20 or 30 miles out at sea; and this, taken in connection with the river velocities at flood and the sand bed, leaves little doubt that the river contributes its quota of sand in aid of that moved along the ocean-shore by the waves and winds to form the large shoals at its mouth.

The maximum velocities of ebb currents in the channels are of course variable. Off Fort Stevens 4.5 miles per hour has been observed by Captain Payson. The coast pilot notes 3.4 miles between Point Adams and Sand Island, and 4.4 between the latter place and Cape Disappointment.

In a paper by Captain Powell, appended to this report, further details as to channels may be found.

The principal elements on whose combination and interaction the actual form of the mouth of the river depends have now been mentioned and may be repeated. They are, tidal flow, river discharge, waves, and sand supply. These elements, that of the waves being omitted, have long maintained a river section at Chinook Point, about 3½ miles wide, with an average depth of 23 feet, and with maximum depth exceeding 36 feet. These forces, with the wave

action included, should be able to maintain similar depths in a somewhat narrower section, at Cape Disappointment.

Having given a general description of the mouth of the river, and of the forces acting there, it will be well to trace briefly the history of the mouth during the period for which it is known, at least in part. The first chart of the mouth, available, is that of Vancouver in 1792. It is on a small scale, and does not
49 state that its plane of reference is low water, but it contains numerous soundings and the points that can be identified are correctly placed with reference to each other. The other charts cover more ground, are in greater detail, and seem to be reliable. The recent ones are exact. The chart of 1839 does not state its plane of reference, but the work indicates that it was low-water, perhaps the mean of lower low-water. In order of dates the charts are as follows:

1792. Vancouver. English Navy.
1839. Belcher's. English Navy.
1841. Wilke's. United States Navy.
1851. United States Coast survey. Hydrography 1850.
1854. United States Coast Survey. Hydrography 1852.
1874. United States Coast Survey. Hydrography 1868.
1876. United States Engineer.
1878. United States Engineer.
1879. United States Engineer.
1880. United States Engineer.
1881. United States Engineer.

Starting from the deep water inside, which is shown on all these charts between Point Adams and Chinook Point, the chart of 1792 shows a single deep straight channel running west into the ocean, and having a least depth of 27 feet. If other or lateral channels exist, they are not shown. The southern edge of Peacock Spit bordered this channel on the north at a distance from Cape Disappointment of three-fourths of a mile. The southern edge of the channel, 1½ miles wide was formed by the northern edge of Clatsop Spit for a distance of 8 miles west from Point Adams; the outer 4-fathom curve being 6 miles west of a line joining Cape Disappointment and Point Adams. In the triangle formed by Cape Disappointment, Chinook Point and Point Adams there was at this time nearly everywhere a depth of not less than 4 or 5
50 fathoms. The charts of 1839 and 1841 agree in essential points. They show that the sea end of the channel, while retaining a westerly direction, is yet 1½ miles further south than in 1792. The depth of 27 feet on the bar still exists. The chart of 1839 also shows a channel running southwest from the main channel, at a point 4½ miles west of Point Adams, with a least depth of 19 or 20 feet. This channel is not shown on the Wilkes map of 1841, his soundings not having covered that area. But by far the most important change is the appearance within the triangular area, already referred to, of Sand Island, the extent of whose shoal within the 18-foot curve was 4 square miles; the middle of the shoal was near the place where 30 feet of water existed in 1792.

A plausible theory to account for this shoal is the following: As Clatsop Spit lengthened the interval between the inside 30-foot curve north of Point Adams and the 30-foot curve outside of the sea end of the channel becomes very much greater than the interval between the 30 foot curves when measured directly across Clatsop Spit, and the shorter path becomes an easy route for the tidal flow. When this difference becomes too great, the tidal flow across the spit will form minor channels, which under favorable conditions may become main channels, leaving the part of the spit cut off an island or a shoal. Thus, in 1792, Vancouver's chart shows Clatsop Spit 8 miles long while the width across it most probably did not exceed three miles. To-day by the main channel the interval between the 30-foot curve inside near Point Adams and outside of the bar is 7 miles, while across Clatsop Spit, where a minor channel now exists, it is but 3 miles. But the lack of surveys between
51 1792 and 1839 makes positive proof of such an origin for Sand Island impracticable.

Defining Sand Island Shoal by its 18-foot curve, the southern part of this shoal was in 1839 where the point of the 18-foot curve of Clatsop Spit now is. Since 1839 this shoal has had its southern side steadily eroded by the currents of the deep channel there, and its middle has moved north 1¼ miles, until it now joins other shoals in Baker's Bay on the north side of the river. In the same period the part above water has moved northward 1¾ miles.

In 1841 there were channels giving 30 feet of water on the north and 27 feet south of Sand Island. As Sand Island moved north, the northern channel was gradually closed, so that now but 13 feet can be carried around its northern side. In 1839 and 1841 these channels joined west of Sand Island, thus giving a single main channel thence to the sea, with 27 feet of water. But in 1852 the minor channel shown in the survey of 1839, crossing Clatsop Spit, which extended 5½ miles west from Point Adams, had become a wide southerly channel, 3 miles west from Clatsop Beach, with 21 feet of water, there still being 27 feet in the sea end of the main or north channel. The part of Clatsop Spit thus cut off formed the Middle Sands, which in 1850 had already become continuous with the Sand Island Shoals, so that from the east of Sand Island two channels ran to the sea, separated by a shoal facing west-northwest, and 6 miles long.

The chart of 1868 shows that the south channel had become the main channel, having 25 feet of water, while the north channel had but 21 at the sea end. The south channel continued to be
52 the main channel for but a few years, and in 1876, the date of the next survey, the north channel was the main one, having 22 feet, while the south one had but 20½.

The chart of 1861 shows the north channel at its sea end nearly in the position it had in 1792, or about one mile south of Cape Disappointment. There were 22 feet on the bar at its sea end. The south channel curves round to the southeast so as to be nearly parallel to Clatsop Shoal, and has but 19 to 20 feet of water with many

lumps having less depths. The depth on the shoal connecting Sand Island with the Middle Sands was increased from 17 to 19 feet in 1880 by scraping. This depth has since increased, so that in May 1882, the main channel passing south of Sand Island crossed the shoal with 21 feet of water to the north channel, and then ran into the sea, passing near Cape Disappointment and having 19 feet of water at its sea end. Sand Island has nearly disappeared as a separate shoal, and it only needs deeper water in the main channel and the continuance of the shoaling of the south channel to make the state of affairs apparently identical with that in 1792.

Nothing thus far has been said in reference to the changes of Clatsop and Peacock Spits, which limit the water-way on the south and north. Both are changeable, the former very much so. Its direction has varied from westerly with a length of 8 miles in 1792, to northwesterly, with a length of 3¼ miles, in 1881. In 1839 its northern edge was but half a mile north of Point Adams, while in 1881 it was 2½ miles. The channel side of Peacock Spit has varied in direction from south to west, and its southern limits has been between three-quarter- and 2½ miles south of Cape Disappoint-
53 ment at different times.

These spits and the channels interact, each changing the other. If a line be traced, which follows generally the highest point of sand, over Peacock Spit, the Middle Sands, and Clatsop Spit, it will be noticed that the depths on the shoal portions of this line vary considerably from time to time. Thus the survey of 1868 shows shoals bare at low-water stretching almost continuously from Point Adams for 2½ miles northwest. That of 1881 shows no such shoals, but instead it is thought there is an average depth on the same line of 4 or 5 feet with a minor channel crossing the spit with 10 or 12 feet in it. The survey of 1868 shows half a mile of Peacock Spit bars at low-water, while in 1881 all is covered. On the Middle Sands the first survey shows a considerable area with less than 6 feet on it, while in 1881 the depths are usually from 10 to 15 feet.

Such increase in depth on the shoals cannot fail to injure the channels through them, the effect is seen in comparing the depth of 21 and 25 feet through the north and south channels in 1868 with the depths of 22 and 19 feet in 1881.

The reason why the excellent channels of 1792, 1839, and 1841 have been replaced by the bad ones of to-day is easily seen. At the former dates there was but one principal channel; now there are two or three, and there may then have been a less average depth on the shoal parts of the sandy cordon, though the charts do not make it certain.

In 1868 it is true that the south channel was the principal one and a good one, but this was coincident with the greatest elevations of Clatsop Spit, the Middle Sands, and Peacock Spit, shown by any of the surveys. This channel lasted but a few years. Its short duration compared with that of the northern channel, indicates a more efficient action at its site of the injurious forces. The
54 spreading out of the tidal flow into a general flow over the ridge, 9 miles long, of the sandy cordon, or the splitting of

it into several important channels must be expected to give bad channels. The diminution of depth on the shoals, or the concentration of main flow into one channel, must be expected to improve the depth of navigable water. In the past so far as we have any evidence, a single main channel has always given a depth of 27 feet on the sea bar.

Having thus given a history of the mouth of the river, the question of its improvement may now be considered.

The problem before the Board is to present a suitable project for improvement of the mouth of the river as we now find it.

It is evident that the depth of water in the channels would be increased if the wide opening between Cape Disappointment and Point Adams were suitably diminished. Some idea of the proper measure of the diminution may be obtained from an examination of a section of the river near its mouth, where there has always been, as far as known, a sufficient depth of channel. Such a section is found between Chinook Point and Point Adams.

If the water-way between Cape Disappointment and Point Adams be narrowed to something less than that between Chinook Point and Point Adams, and the volume of the water be properly directed, we may reasonably expect as good a channel to be the result.

It may be supposed the best way to accomplish the object stated above would be to place a structure on the bar, leaving an opening between it and Cape Disappointment or Point Adams, or openings at both places. It is believed the construction of such a work would be impracticable. If practicable, the expense would be enormous.

A more satisfactory method of attaining the desired results presents itself. This is to build a single jetty from Point Adams so as to make the distance between its outer end and Cape Disappointment nearly the same as that between Chinook Point and
55 Point Adams, and, inasmuch as at the section between Cape Disappointment and the proposed jetty the wave action is very potent, and does not exist at Chinook Point section, it is thought best to make the new mouth of the river narrower than the present Chinook section.

It is to be observed also, that Cape Disappointment is fixed, and its attached spit, the Peacock Spit, has been persistent. On the contrary the position of Point Adams, unlike Cape Disappointment, has been quite unstable. Its attached spit, the Clatsop, has also varied greatly in extent and position. Moreover, while the south channel was for a short time the best entrance, the characteristics of permanence and excellence have belonged more constantly to the northern.

These facts are mentioned as indicating the propriety of sacrificing, as some would call it, the possibility of the formation of a good south channel, to the reasonable certainty of producing and maintaining one good channel in the northern position.

A careful study of the present characteristics of the river and its past history, leads fairly to the conclusion that at its mouth it may be at this time approaching the condition shown on the map of Vancouver of 1792, on which a single large and deep channel is

indicated, with a nearly westerly direction; and it is not improbable the river would in a few years, without the interference of man, return to that condition. This, however, is not certain; even if it were certain, the commercial and other interests involved cannot afford to wait the slow action of natural causes unassisted, and the plan of improvement submitted by the board assists these tendencies, and hastens and secures their results.

In any work of this character great care should be taken that the action of any structures placed in the river be not too violent.
56 Otherwise, harm and not good may be done by them. The great agent to make the channel deep over the bar and maintain it, is the tide. This has an ample force and volume, but its action requires regulation and direction to the important point. The jetty intended for the improvement of the channel over the bar should — so arranged in plan and in height as not to obstruct unduly the free entry of the flood tide into the basin near the mouth of the river from which it is to ebb and do the work required of it. The artificial structure should also have such a position as to force the whole volume of the ebb towards a limited area of the bar through a single channel, and not to have it spread out and its power expended over too large a space and through several channels.

The plan proposed by the Board is based on these ideas. The structure is kept down to the level of low-water, and therefore does not materially obstruct the inflow of the flood-tide. It regulates and directs the whole volume of the ebb below the level of low-water.

The Board recommends the construction, at as early a day as possible, of a jetty, slightly convex to the north, extending from the shore near Fort Stevens in a northwesterly direction towards a point about three miles south of Cape Disappointment, this jetty to stop short of that point or be prolonged beyond it, as experience may indicate to be necessary. Its location is shown on the chart herewith on the engineer hydrography of 1881 and 1882.

It is impossible to state in advance exactly the width that the work should give to the channel at Cape Disappointment to secure deep water on the new bar outside. That the maintenance of the
57 works may be practicable it certainly must not be too small. Three miles have been taken, which will be somewhat reduced by the continued existence in a modified form, of Peacock Spit. A certain latitude in the amount of contraction is very desirable. Should that adoption be too small, it can be increased either by raising the jetty somewhat, or by a short jetty on Peacock Spit.

This jetty is expected to be mainly of stone, and the estimate is on that basis. In depths greater than 15 feet at high-water, where it is found practicable to lay mattresses, the structure should be as follows: There should first be laid a very strongly built mattress about 3 feet thick, and upon this a layer of rubble-stone 3 feet thick; then a mound of stones of large size, with a top width of not less than 5 feet, the slope on the outside to be one perpendicular on 3 base, and on the inside one perpendicular to 2 base. Where the shock of heavy seas is to be sustained, this mound should be faced

with *beton* blocks of from 5 to 20 cubic yards each. The apron which forms the foundation of the mound should project in moderately smooth water 10 or 15 feet beyond its base, and 25 feet where the seas are heavy. Where mattresses cannot be placed, owing to the roughness of the water, the apron of rubble-stone should be 5 feet thick. In winter less than 15 feet deep at high-water, the jetty should consist of a mattress 30 or 40 feet in width, covered by stone.

The jetty is intended to be brought up to the level of low-water. It is estimated that of this jetty 5000 linear feet may be built in water of 6 feet depth or less at low-water, 7500 in water between 6 and 11 feet, 4000 in water between 11 and 16 feet, 7500 in water between 16 and 21 feet, and that the last 7500 feet will need
58 the facing of heavy beton blocks. The facing of this last 7500 feet is expected to add 25 per cent. to what its cost would be if not so protected. The prices below are on a basis of $5 per cubic yard of the whole mass in place.

5000 linear feet at $45	$225,000
7500 linear feet at $80	600,000
4000 linear feet at $140	560,000
7500 linear feet at $310	2,325,000
Total	$3,710,000

The position is one of very great exposure, and the allowance for contingencies should be large, probably not less than 50 per cent. If this margin be accepted, the total estimate amounts in round numbers to $5,500,000.

It should be stated, however, that while the Board considers stone to be the material which must form the great mass of the structure, we do not desire to discourage the use of wood in the shape of mattresses or pile work in the shallower water, and indeed wherever it may be found practicable to introduce it, if economy in construction be thereby promoted. A favorable circumstance in this connection is the apparent absence over a considerable length of the proposed works, of the sea-worm, which, in some other sections of the country, proves so very hurtful to structures of which wood is a part, and practically prohibits its use for work of a permanent character.

The work proposed, transfers in effect the river section now existing at Chinook Point, with depths of 40 feet, to Cape Disappointment, 6 miles farther seaward. Judging from the present form of the river mouth, this will throw the sea-bar seaward of the present one with deep water on it. If the work is built and it causes a deep channel to be cut across the sand cordon, it must yet be expected that ultimately a new sand cordon will be formed far to seaward
59 of its end. But considering either the slight projection to be noticed in the present 100-foot curve opposite the mouth of the river, or from the small amount of sediment in the river as compared with great sediment-bearing rivers, such an event seems too remote to enable even a guess to be made as to its date.

In a location like the mouth of the Columbia River, where the building of any work of magnitude is certain to be one of great difficulty, it is impossible to foresee with precision the order of construction in its details, and much latitude must be left to the judgment of the local engineer in changing them and perhaps the location selected, as varying conditions may indicate or changes occur.

The cross-section upon which the estimate is made, is considered to be an approximate one which may need to be increased or decreased in places—the best that can be now devised under the circumstances and as that which may be ultimately assumed by the structure.

It is the opinion of the majority that the work proposed should be brought only to the level of low tide. If, however, experience should demonstrate the necessity for raising the jetty to any level greater than low water, it can be readily done on the lower jetty as a foundation. It should be observed, however, that the violence of the waves will be more severely felt and the difficulty of maintaining any work be increased as its height is the greater.

The Board realizes and has already called attention to the exposure of the position and the difficulty to be expected in building the jetty, especially its outer part; but it is to be observed that the head of the jetty will be partly covered by the middle sands, and be thus sheltered from the most severe wave-action.

60 The local engineer is of the opinion that the effect of the great number of large nets used in the salmon fishing is injurious by causing a general leveling of the shoals, from contact of the heavy sinker line with the bottom, and a diminution of the current at the time when the river is in flood and charged with sediment. This opinion is shared by other persons who have been questioned, though by no means by all. While there is a coincidence between the gradual lessening of depth in the channels and a flattening of the shoals during the years from 1879 to 1882, and the commencement and increase of fishing on the bar, the other members of the Board see no evidence in the facts brought to their attention that this is more than a coincidence, or that the fishing on the bar has been a cause of shoaling of the channels to an appreciable or hurtful extent. It has been proposed to forbid by law fishing below the line connecting Chinook Point and Point Adams. It is said that such a regulation would be generally acceptable to the fishing interests as tending to prevent loss of life of fishermen on the bar and the driving of fish away from the mouth of the river. The Board, while inviting attention to this matter, does not feel called upon to recommend legislation concerning it.

In 1868 much of Clatsop Spit was out of water, and there was a south channel with 25 feet in it. It might be hoped then, that a work which should only aim to raise Clatsop Spit above low-water would again leave the conditions of 1868 with a good south channel. The Board does not feel any confidence in such a result, nor in its permanence should it occur. Such a work would tend to throw the ebb-current toward Cape Disappointment, and in this respect would perhaps in part produce the effects expected from the jetty proposed

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by the Board, but in a less effective way. Should the jetty of the Board, when extended to the northern edge of Clatsop Spit,
61 produce the depth of water in the north channel aimed at, viz, 30 feet at low-water, no engineer would think of carrying the jetty farther.

The Board has also considered the propriety of raising the jetty to mid-tide, and the opinion of the majority is that it should *should* be kept at first to the level of low-water. The reasons for this conclusion are the following, which have been adverted to in another part of the report. A work brought up to low-water will be quite effective in directing the ebb-tide, while it would interfere much less with the inflow of the flood-tide. The exposure to waves and the consequent difficulty and cost of construction will both be considerably less if the lower height of the jetty prove to be sufficient. If this height be too little, it can be increased.

It seems worthy of special remark that while there are differences of opinion among the members of the Board as to the height and length to be given to the jetty starting from Point Adams, there is entire unanimity as to the necessity for such a structure. Four members of the Board think the height at first need not be greater than the level of low-water, but the outer end should be at a point nearly south of Cape Disappointment. Lieutenant-Colonel Mendell is of the opinion that under existing circumstances it is not expedient to extend the work beyond the limits of Clatsop Spit, but he would build it to the height of mid-tide or perhaps higher.

In conclusion the Board thinks it important to state that in an undertaking of this character, where the exposure is so great, as large a portion as possible of the whole estimate should be available before beginning of actual construction, and the work, when commenced, should be carried forward as rapidly as practicable, with a view of attaining, at the earliest day, the desired object, viz,
62 a deep channel to the sea to accommodate the great and growing commerce of which the Columbia River must be the avenue, and to the growth of which the present condition of the bar is a very formidable obstacle. When operations have once begun, there should be no suspension of them, as in such a case, besides the loss of time, injuries to the unfinished work and unfavorable changes in shoals and channels may be expected to such an extent as very greatly to increase the cost.

The following maps and papers are forwarded with the report:

1. Chart of mouth of Columbia River, with engineer hydrography of 1881, scale 1:40,000, published by the coast survey showing 18-feet curves of depth on Middle Sands, May, 1882, and location of the jetty as proposed by the Board.
2. Tracing of chart of Vancouver's survey, 1792 Scale 1:40,000.
3. Tracing of chart of Belcher's survey, 1839, scale 1:40,000.
4. Tracing of chart of coast survey, 1868, scale 1:40,000.
5. Description of entrance to Columbia River, as shown by different surveys.
6. Extract from description of headlands, bottom of the ocean,

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tides, currents, etc., prepared at United States Engineer Office, Portland, Oreg., and published in 1882 by the Portland Board of Trade.

7. Statement of direction, duration, and velocity of winds, as observed at Portland, Oreg., compiled at the office of the Chief Signal Officer, Washington, D. C., August, 1882.

8. Report of examination of Bar at mouth of Columbia River, Oregon, May, 1882, by Lieut. P. M. Price.

9. Statements of commencement and increase of bar net fishing.

10. Commercial statistics from annual report of engineer in charge 1881 '82.

11. Table of trade of commerce of Portland, Oreg., and registered tonnage crossing Columbia River Bar, published by Portland Board of Trade.

C. SEAFORTH STEWART,
Lieutenant-Colonel of Engineers.
WM. P. CRAIGHILL,
Lieut. Col. Engineers, U. S. A.
C. B. COMSTOCK,
Lieut. Col. Engineers.
CHAS. F. POWELL,
Captain of Engineers.

63 Page 14 of Washington's Exhibit C is as follows:

Locations and Depths of Channels at Times of Different Surveys.

Authority of survey.	Year.	Channels over outer bar.		Distance of bar at mid-channel from middle of line connecting Cape Disappointment and present Point Adams.	Remarks.
		Name.	Depth.		
			Feet.	*Miles.*	
Admiral Vancouver..	1792	Single Entrance...	27	W. 6	One channel.
Sir Edward Belcher..	1839	Main Entrance....	27	W. 5, S. 1.....	Leads northeasterly through Baker's Bay. A cut-off with 21 feet at western angle of Middle Sand Bank connects with Queen's Channel.
Do	1839	South Entrance to Queen's channel.	19½	W. 3, S. 2.....	Cut-off from main entrance has 21 feet. Junction of the two channels at east end of Sand Island carries 25 feet.
Captain Wilkes	1841	Single Entrance...	27	W. 5	Divides into two channels around Middle Sand Bank; 27 feet can be carried through east junction of channels.
United States Coast Survey, 1851.	1850	North channel	27	W. 2, N. ½.....	Around Middle Sands by Baker's Bay; 22 feet in Chinook Spit Channel.
Do	1850	South channel	19	W. 3½, S. 1½.....	Channel narrow and almost closed by 16 feet shoal.
United States Coast Survey, 1854.	1852	North channel	27	W. 3, S. ½.....	Into Baker's Bay; 21 feet off Chinook Spit.
Do	1852	South channel	21	W. 1½, S. 3½.....	The better channel to river.
United States Coast Survey, 1874.	1868	North channel	21	W. 4	Into Baker's Bay; 21 feet on bar of Chinook Spit Channel.
Do	1868	South channel	25	W. 2½, S. 3½.....	The better channel.
United States Engineer (Jessen).	1876	North channel	22	W. 4, N. 1.....	Into Baker's Bay; 18 feet on Chinook Spit Channel Bar.
Do	1876	South channel	20	W. 2, S. 3.....	The better channel to river.
United States Engineer (Payson).	1878	North channel	23	W. 4½, N. 1.....	Into Baker's Bay; 17 feet on bar in Chinook Spit Channel.
Do	1878	South channel	20	W. 2, S. 1½.....	The better channel to deep water in river.

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Locations and Depths of Channels at Times of Different Surveys—Continued.

Authority of survey.	Year.	Channels over outer bar.		Distance of bar at mid-channel from middle of line connecting Cape Disappointment and present Point Adams.	Remarks.
		Name.	Depth.		
			Feet.	*Miles.*	
United States Engineer (Jessen).	1879	North channel	23	W. 4, N. 1½.....	Into Baker's Bay, 14 to 15 feet on bar in Chinook Spit Channel.
Do.....	1879	South channel	20	W. 1¼, S. 2½.....	The better channel; 14 to 15 feet at middle of "Middle Sands"—line of Scarborough Head and Clatsop Spit—¾ mile between 18-foot curves.
Do.....	1880	North channel	21	W. 4, N. 2.....	Into Baker's Bay, 14 to 15 feet on bar in Chinook Spit Channel; 17 feet across narrow neck of Middle Sands, next west of Sand Island. Scraped this year, with increase of 2 feet in depth.
Do.....	1880	South channel	19	W. 2, S. 2.....	The better channel through to deep water in river, preceding scraping at cut-off.
United States Engineer (Price).	1881	North channel	20	W. 4, N. 2.....	20 feet in cut-off. South channel closing; average depth 18 to 19 feet, with many lumps; 12 to 13 feet in Chinook Spit Channel.
Do.....	1882	....do	19	W. 4, N. 2¼.....	21 feet in cut-off. South channel full of lumps, with 15 to 17 feet of water on them; Chinook Spit Channel not changed. Seventeen feet at middle of Middle Sands, with ¼ mile between 18-foot curves; increase of 2 feet obtained by scraping, followed by shoaling.

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64 Page 19 of Washington's Exhibit C. is as follows:

Report of Examination of Bar, Mouth of Columbia River, by Lieut. P. M. Price, Corps of Engineers.

ASTORIA, OREG., *May* 31, 1882.

SIR: I have the honor to submit the following report of an examination of the bar at the mouth of the Columbia River, with a view to the selection of a suitable channel for scraping, made on May 23 and 24, 1882, in accordance with your letter of instructions dated May 20, 1882.

The examination was made with the bar tug Astoria, whose position at short intervals, generally two minutes, was determined by theodolite readings at the two shore stations on Cape Hancock and Fort Stevens, used during my survey of May and June, 1881. The methods were in every respect the same as used on that survey, described in my report of July 13, 1881.

A comparison of this examination with the survey of 1881 shows that Clatsop Spit has changed but little, if any, in position or extent. The southern side of Sand Island has about the same position, but the northern point has made out considerably further into Baker's Bay. The "cut-off" channel between the old south channel and the north channel has widened and deepened, and shows a least depth at mean low-water of 21 feet. The Middle Sands have made to the northward throwing the north channel to the north, and Peacock Spit has made to the eastward. The north channel shows a least depth of 19 feet at mean low-water. The south channel is about the same as last year, full of lumps, with 15 to 17 feet of water on them.

A thorough examination was made of that part of the Middle Sands between the north and south channels where the survey of last year indicated that there was a disposition for the ebb
65 currents to break through and open a new and straight channel. The cutting out at this locality has continued, and now there is a straight channel over the sands with a least depth of 17 feet. The distance between the 18-foot curves in passing through this channel is one-quarter of a mile, and between the 24-foot curves is 1½ miles. There is one lump with a least depth of 17 feet, one-quarter of a mile to the eastward, and detached from the general 17-foot shoal.

The tug was allowed to drift from the deep water off Clatsop Spit buoy when the tide was about half-ebb, and the result shows that ebb currents set directly through this channel with great force. The bottom is hard sand. It was therefore selected as the proper place to scrape, and on the 28th of May three buoys were placed by the Shubrick, the light-house tender, as guides for the scraping. Two of these buoys are on the north side of the channel 3¾ miles magnetic south of Cape Hancock, and one on the south side of the channel selected, the width between them being three-fourths of a mile.

The scraper is the one used on the "cut-off" in 1880. It is no ready, a tug engaged, and scraping will be commenced on the fir suitable day.

In closing this report I desire to call your attention to the inj rious effect, in my opinion, of the fishing upon the bar. The fishin season is fixed by law from the 1st of April to the 31st of July. Th nets used are about 300 fathoms in length and 30 feet in width.

Formerly the fishing was confined to the river proper, but durin the past three or four years the fishing has gradually extended fu ther down, until during the past two seasons, as well as this seaso many boats have fished out upon the bar itself. On the 24th

May I counted thirty-one boats on the Middle Sands and i
66 the south channel.

The surveys of the last three years show that the sand have flattened out, and now cover a much greater area than fo merly, have deepened, and that the channels have shoaled unt they are almost obliterated. It would certainly seem that this effe is directly due to these immense nets drifting backwards and fo wards on the sands during the season when the currents are th strongest by reason of the high water in the Columbia. I do n think that natural causes, or these combined with artificial mean such as scraping, or the water-jet, or blasting, will ever be able t open out and maintain a good channel over the bar as long as th fishermen are permitted to drag their nets over it and stir up th sand as they now do.

PHILIP M. PRICE,
First Lieutenant of Engineers.

Capt. Chas. F. Powell, Corps of Engineers.

Mr. MACDONALD: I should like to ask the State of Oregon at th time if it will stipulate with us that either party may use the e hibits introduced by the other, so that there may be no duplicatio of maps?

Attorney-General CRAWFORD: Certainly. There is no need duplicating maps.

Mr. MACDONALD: For that reason we will not introduce duplicat of the maps you have already introduced.

Mr. MACDONALD: I desire to introduce in evidence, commencin on page 8 with the words "Below Walker Island a 25-foot chann

may be found," page 9 and that portion of page 10 endin
67 as follows, in the second paragraph: "In the meantime, th

advantages and profits of the improvement are being lost from House of Representatives, Executive Document No. 38, 52n Congress, 1st Session, being a report made by Thos. H. Hanbur Major Corps of Engineers, U. S. Army, to Brig. Gen. Thos. L. Case Chief of Engineers, U. S. Army, and by the Chief of Engineers the U. S. Army officially transmitted to the Secretary of War and b the Secretary of War, on Dec. 8, 1891, transmitted to the Speak of the House of Representatives. The date of this report from whic I offer an extract is September 8, 1891, and was made from Portlan

Oregon, and is from a report of a Survey of the lower Willamette and Columbia Rivers, Oregon, with a view of securing 25 feet at low water from Portland to the mouth of the Columbia.

Let the record show that the exhibit is duly authenticated by the Chief of Engineers of the United States Army and by the Assistant Secretary of War, Robert Shaw Oliver, under the seal of the War Department.

The volume from which the above extract was offered was marked Washington's Exhibit D, and signed by the Commissioners.

Pages 8, 9 and 10, so far as offered, read as follows:

"Below Walker Island a 25-foot channel may be found until the head of Cathlamet Bay at Jim Crow Point is reached. At this point, which is 29 miles from the crest of the bar, the river commences to widen rapidly, spreading out over numerous shoals separated by channels of varying depths. The width between the mouth of John Day River on the Oregon side and the mouth of Gray River on the Washington side where the widest part is found is 9 miles. Just below this, between Tongue Point and Portuguese Point, it
68 contracts to 4 miles. The main volume of water at Jim Crow Point is divided into two parts, one going down the Washington shore and maintaining the present ship channel along that side for 5 miles farther down, where it crosses over to Tongue Point; the other on being deflected from Jim Crow Point continues in a southwesterly direction, maintaining a 25-foot channel until Snag Island is reached. Here its force is wasted by its being spread out over the adjacent shoals and through smaller channels. Formerly there were two well-defined channels here, one to the north, the other to the south of Snag Island, these joining again below the island. The north channel is now entirely closed, but an opening to the northward is still maintained farther down, through which a large volume of water escapes. At this point the South Channel is shoal. There is a space here of about 3,000 yards length with an average depth of 14 feet, leaving 11 feet to be dredged for a 25-foot channel and 8 feet for the 22-foot channel. After passing this, 25 feet can be carried to a point about 1 mile north of Tongue Point. There is a distance of about 1,000 yards here where dredging may be necessary to give the depth required. At Tongue Point there is a channel leading directly west, having for a short distance at a point near Fort Stevens a least depth of 18 feet, and another passing close around the point and along the shore in front of Astoria. This channel carries greater depths than 25 feet throughout, excepting for a short space just above Upper Astoria. Here the ruling depth is 20 feet.

Following the present ship channel from Jim Crow Point down it inclines south to round the shoal water in the vicinity of Pillar Rock, thence back to the Washington shore, which it follows to the crossing, thence over to Tongue Point. The ruling depth
69 here is practically 20 feet at mean low tide. The average rise of tide is 7 feet.

This channel has the great disadvantage of making a crossing in a wide place in the river bed where the sands are continually work-

ing down and changing its direction and capacity. Works erected with the view to holding it in any one position would at times have to contend against the natural inclination of the river, and would therefore be expensive and uncertain in their results. It would be practicable to force this water to continue down the north shore and improve the depth of water on that side, should the necessities of commerce warrant the expense. At present the problem is to obtain the depth of 25 feet to the sea by the most practical and economical route, and with the least disturbance of the present existing conditions. Taking the channels in this locality in their different positions as we now find them, and considering the present tendencies of their several courses, together with other facts and interests bearing upon the problem, it would seem best to restore and maintain the one passing to the south of Snag Island. If the water that is diverted by Jim Crow Point into the head of this channel can be continued down and kept from spilling out as it were over the adjacent shoals, and these shoals are encouraged to build up, the desired object will undoubtedly be attained. Mention has before been made of the fact that a large portion of this water is lost at Snag Island, where it escapes to the northward. I would recommend that this opening be closed by suitably constructed dikes or dams, and in order to facilitate its passage and give it direction over the shoal below that a channel 22 feet deep and 150 feet wide be dredged through this. The erosive action of the water would continually enlarge this dredged channel until it had gained a normal section commensurate in size with its own requirements.

70 While this is being done there will be a tendency to an increase of flow through the two openings in this locality leading southward into what is known as Prairie Channel. This might cause an enlargement of these, which would retard, if not altogether prevent, the opening of the channel through the shoal. These openings should therefore be closed at the same time that the escape of the water to the northward is prevented. I have indicated on the tracing herewith the location of these dams and of the cut that it is proposed to make through the shoal. The aggregate length of the diking at present necessary in this locality is 15,000 feet. The estimated amount of material to be dredged in order to obtain a 22-foot channel here is 400,000 cubic yards, and to obtain a channel 25 feet in depth the removal of 540,000 cubic yards will be necessary.

Where this channel joins the present ship channel about 1 mile north of Tongue Point there is a distance of 1,000 yards where the present depth is less than 25 feet. The indications now are that this is cutting out, and it is possible that before the permanent works proposed can be constructed we may find 25 feet of water here. In its present condition it will require the dredging of 55,000 cubic yards of material to provide a 22-foot channel and 96,000 yards to provide the 25-foot channel.

At the shoal place before mentioned, which is in front of Upper Astoria, there will be 20,000 cubic yards of material to be dredged in order to obtain a 22-foot channel, and 75,000 cubic yards to obtain

the 25-foot channel. From here to the sea, a distance of 15 miles, there is a good channel having a depth of 25 feet or more. In this locality the average rise of tide is 7 feet.

It is not deemed necessary or advisable at the present time
71 to locate any permanent works with the view to controlling the water below Tongue Point. When those that are herein proposed for procuring and maintaining the 25-foot channel above this point have produced their effect a resurvey of the river in this locality will indicate the points where permanent works can be placed to the best advantage, if any be found to be necessary, in order to maintain the deep water to the sea.

It may always be expected that in a wide expanse of river such as is found here, where sands are continually drifted about by the waves and current, that points of shoals wil- occasionally get into the deep channel and may change its course or temporarily impair its depth, to the disadvantage of commerce. To provide for emergencies of this kind one or more good dredging machines should be constantly on hand, with funds for operating them as may be required. This can not be avoided at the present time by permanent works unless at an expense for original construction and maintenance that would far exceed the expense of the occasional dredging.

Everything should be done to encourage the building up of these shoals so that they may be similar to those on the south side of Cathlamet Bay, near Prairie Channel, where we find them at a height nearly to that of extreme tide and covered with grass. When this is done the water will be deep and confined to well-defined channels.

We have every reason to believe that at none of the localities where improvement is required will there be anything more formidable to remove from the desired channel than sand, with perhaps an occasional snag or stump buried in it. The undertaking is not formidable in its character nor are there any difficult abstract engineering problems to be solved. It is merely a question of time and money. If the funds necessary for the execution of the
72 project can be supplied as they can be profitably expended the first results will soon be obtained. We are not wanting in examples from experience, which show clearly that if the funds are not so provided the cost will be greatly increased and the time of procuring the desired results will be greatly prolonged. In the meantime the advantages and profits of the improvement are being lost."

Mr. MACDONALD: The State of Washington offers in evidence pages 11, 12 and 13, and also the paragraph on page 15, being taken from the report of Mr. G. B. Hegardt, Assistant Engineer, to Capt. W. C. Langfitt, Corps of Engineers, U. S. A., and through regular channels transmitted to the Chief of Engineers, U. S. A., and by him to the Secretary of War, the report being dated at Fort Stevens, Oregon, October 14, 1899, and found in House of Representatives Document No. 94, 56th Congress, 1st Session, which is duly authenticated by the Chief of Engineers of the U. S. Army, and by the Assistant Secretary of War, under the seal of the War Department.

The volume was marked Washington's Exhibit E, and signed by the Commissioners.

Pages 11, 12 and 13 of said volume read as follows:

Report of Mr. G. B. Hegardt, Assistant Engineer.

OFFICE OF UNITED STATES ASSISTANT ENGINEER,
FORT STEVENS, OREG., *October* 14, 1899.

CAPTAIN: I have the honor to submit the following report on survey of the mouth of the Columbia River, Oregon and Washington, with a view of obtaining a channel depth across the bar of 40 feet at lowest low water, with plan and estimate of cost of improvement.

73 *Survey.*—For the annual report for the fiscal year ending June 30, 1899, a survey was made of the mouth of the river, the area covered lying seaward of a line joining the end of the jetty and Cape Disappointment, with the exception of the taking of soundings on the shoal parts of the spits and around the end of the jetty.

On August 28 a survey party was organized for the purpose of completing the survey seaward of the jetty and to continue it up stream as far as deemed necessary. All depths refer to the mean of the lowest low waters. The survey just completed (Pl. III) shows that the channel across the bar is gradually deteriorating, and that it has done so since the completion of the jetty in 1895, when the channel depth was 31 feet for a width of over one-half mile. The present survey, on the other hand, shows that the 1895 31-foot channel has entirely disappeared, and in its place there is a channel whose depth is only 28 feet for a width of five-eights of a mile. In 1895 (Pl. II) the direction of the bar channel at its sea end was southwest, while in 1899 it is northwest, which represents a movement of the channel at the sea end of about 2 miles since 1895. Where the 1895 channel crossed the bar there is now only about 24 feet of water, and in the position of the present chanel there was but about 22 feet of water in 1895.

The 30-foot curves of the outer slope of the bar have changed but little, and occupy about the same position for the two years. On the inside of the bar, however, the 30-foot curve does not join the outer curve by about 8,000 feet, with greatly reduced depths.

74 Inside of the bar, near Peacock Spit, the 30-foot curve has been forced southward about 1,000 feet, owing to the building up of the spit, and on the south side of the channel, in the vicinity and ahead of the jetty, the 30-foot curve shows a southerly movement of about 2,000 feet and follows for some distance approximately the 24-foot curve of 1895.

The 24-foot curve on the north side of the channel has practically disappeared from the bar, and follows a course about parallel to the shore line of Cape Disappointment. On the extension of Clatsop Spit the 24-foot curve has worked its way well into the spit, greatly

increasing the depth over it, leaving the distance between the 24-foot curves on each side of the channel about 2 miles apart. There has been a general shoaling of the channel, with an increase of depth on either side of it. Peacock Spit shows a much larger development than in 1895, and the harbor throat near the end of the jetty has greatly increased in cross section. Clatsop Spit increased in elevation, and the depths along the north side of the jetty, toward its end, are much less than in 1895; otherwise the position of the spit is much similar to that of this latter year. The channel from Fort Stevens to the end of the jetty shows a much greater cross-sectional area. This matter will be adverted to hereafter.

General description.—A brief description of the general characteristics of the Pacific coast harbors and the entrance to the Columbia River before the commencement of the jetty work is given herewith as a matter of general interest and information in considering the project for the further improvement of the mouth of the river.

All harbors on the Pacific coast of the United States, with
75 the exception of those on Puget and Washington sounds, are bar harbors, which, in the majority of cases, have been, or are now being, improved by the jetty system, and one of its noticeable features is the limited number of harbors of any kind along the main ocean shore. Prior to the improvement of the entrance to the Columbia River there existed upon the entire ocean shore line of the States of California, Oregon, and Washington, from the southern limit of California to Cape Flattery, the entrance to the straits of Juan de Fuca, a distance of 1,200 miles, only one first-class harbor, that of San Francisco. From San Francisco to the mouth of the Columbia River the distance is about 550 miles and to Cape Flattery about 700 miles.

Since its discovery, in 1792, the Columbia River had been recognized as one of the chief harbors of this coast; but on account of the shifting channel or channels, variable in depth as well as numbers, for years had a bad reputation among underwriters and seafaring men. The nearly always insufficient depth of the bar channel prevented deep-draft vessels from crossing, principally out, except on a smooth bar, and as a consequence they were often held "bar bound" for weeks at a time. The violent and dangerous winds on this coast, usually increasing in velocity as they pass in a more northern latitude, blow from the south and southeast and are accompanied and followed by a very heavy swell, which breaks with great force upon the coast. During the stormy season was also the time of arrival and departure of the greatest number of vessels. Vessels of a greater draft than 19 feet were held until a coincidence of a spring tide
and a smooth bar permitted them to cross. If on the occasion
76 of a spring tide the bar was rough, they were compelled to wait until such time as the above two conditions were favorable. The ruling depth of the bar channel for a number of years previous to the construction of the jetty was 20 to 21 feet. With the increased depth of water obtained in the Columbia River toward Portland by the aid of Federal appropriations, the frequent and often

prolonged delays of vessels at the river's mouth soon became a heavy tax on shipping through excessive rates of insurance and freight charges; and it soon became evident that a permanent channel over the bar of sufficient depth and width to permit vessels of deepest draft to pass safely in and out at all times was needed in the interest of commerce of which the Columbia River must be the avenue, and the continued development of a large section of the country, to the growth of which the condition of the mouth of the river was a very formidable obstacle.

Original project.—The first step taken by the Government looking toward the improvement of the mouth of the Columbia River was in August, 1882, when, in conformity with an act of Congress, a Board of Engineers, consisting of Lieutenant-Colonels Stewart, Mendell, Craighill, and Comstock, and Captain Powell, visited the locality, and, after personal examination and full conference with pilots and others familiar with it, submitted a plan and estimate for its permanent improvement. Majority and minority reports were submitted; the former was approved, and the project for the improvement of the mouth of the Columbia River was adopted. These reports form Senate Ex. Doc. No. 13, Forty-seventh Congress, second session, and describe in detail the condition of the channels for different years from 1792 to 1882, the changes which took
77 place at different periods, etc., and attention is invited thereto for further and valuable information.

The Board recommended the construction, at an early date, of a jetty slightly convex to the north, extending from the shore near Fort Stevens in a northwesterly direction toward a point 3 miles south of Cape Disappointment, this jetty to stop short of that point or be prolonged beyond it as experience might indicate to be necessary. Its location is shown on the chart of 1885 (Plate I).

The jetty was to be of stone, on a mattress foundation, and be up to the level of low water. The Board estimated this jetty to cost $3,710,000 without contingencies. The opinion of the majority of the Board was that the work proposed should be brought only to the level of low water, but if experience should demonstrate the necessity for raising the jetty to any greater level than that of low water it could be readily done on the lower jetty as a foundation.

Commencement and completion of the jetty.—The first appropriation was made in the river and harbor act approved July 5, 1884, the amount being $100,000. Active operations were begun in April, 1885, and continued with more or less interruption until late in October, 1885, when the jetty was completed. In the early part of 1893 a Board of Engineers was appointed for the purpose of considering the results obtained and data collected during the construction of the work, and report upon the matter of its final completion. The Board submitted its report in May, 1893, and recommended the construction of four groins or spurs to be built out from the main jetty, one near the shore, one near the end of the jetty, and the other two between the end groins. With regard to the jetty itself, the Board recommended that when completed the top
78 at the shore end should be 12 feet above low water, and should slope thence to reference 10, 1⅛ miles from the shore, thence

to reference 4 at the outer end. The length of the jetty from its shore end is 4¼ miles, and is was completed in acordance with the above recommendation at the cost of $1,948,223, leaving an unexpended balance on hand of $77,457, the total of all appropriations having been $2,025,680. Out of the balance of $77,457, $50,000 was transferred by act of June 3, 1896, for improvement of Columbia River below Tongue Point.

Cost of the jetty.—The total amount of rock used for the jetty was 945,923 tons: Including in the item of rock all expenditures, such as jetty, tramway, mattress work, plant, etc., the cost was then practically $2 per ton of rock in place.

The length of the jetty, counting from its shore end, is 22,460 feet, which, including in the jetty proper the four groins and the shore revetment, brings the cost of the completed jetty to practically $87 per linear foot. The mean height of the whole jetty enrockment was 25 feet and the mean depth of water at low water, in which the jetty was built, was 15 feet.

Present condition of the jetty work.—Since the completion of the jetty, in 1895, the action of the waves has considerably reduced the height of the enrockment near its outer end. At the present time the jetty remains as completed from its shore end for a distance of 2¾ miles. From this point it slopes gradually down to low water seven-eighths of a mile away, and from here to the end the top of the rockwork is to elevation of low water, or a foot below this datum (Pl. VII). Three thousand four hundred feet of the
79 outer end of the jetty tramway has been washed away by the sea. The remaining portion of the track is in a condition to be repaired and used for the extension of the jetty. The groin at the outer end of the jetty has almost entirely disappeared, but the other groins remain as completed.

Condition of channel, 1885 and 1895.—Having briefly noted the commencement, progress, and completion of the jetty, with its present condition, a comparison of the surveys of 1885 (Pl. I) and 1895 (Pl. II) showing the conditions of the channels and shoals of the entrance to the Columbia River prevailing at the time of commencement and completion of the jetty, will be taken up: In 1885 the north channel had practically disappeared, leaving the south channel the only one to be used by vessels of deep draft. The direction of the channel at its sea end was east by south. Over the "Middle Sands," lying between the north and south channels, the depth of water was from 10 to 12 feet. In the "cut-off" channel leading to Baker's Bay anchorage the depth was 14 feet in a narrow channel, while at the upper end of Sand Island the channel depth was only 8 feet.

The area of Peacock Spit was less than in 1881, but showed a small portion of it bare at low water. Clatsop Spit had gained more or less in all directions and the depth of water over it continued to increase from 1868 to 1885, when it was the greatest shown on any of the charts, with a swash channel, "Tillamook Chute," running almost across it. Over the inner bar, across the mouth of the south or main ship channel of the river, there was only 19 feet of water.

In 1895 Clatsop and Peacock spits attained their greatest development in both elevation and area, so far as it was known up to that time, thereby, with the jetty, effectually controlling the ebb
80 waters and concentrating them into one more defined and deeper channel across the bar, entirely sweeping away the "Middle Sands" and producing a direct channel from the river to the sea, whose direction was southwest, a movement of the channel at its sea end of 3½ miles. What was the south channel in 1885 had gradually shoaled up on line with the jetty and been entirely covered by the south spit, removing all traces of the former channel. The channels at both ends of Sand Island had nearly closed with an extensive decrease of depth over the whole of Baker's Bar area.

Sand Island, as a whole, had undergone few changes in its position, considering the decided changes which had occurred elsewhere during this period of ten years. The inner bar had been entirely removed, increasing the depth there from 19 feet to 32 feet, a greater gain in depth than was effected on the outer bar. Clatsop Spit, from having over it an average depth of about 6 feet, increased in elevation so as to be, over a large portion of it, 6 to 8 fee above low water.

During the construction of the jetty annual examinations of the bar were usually made. Not until 1889 were any particular changes noticeable; and while there was no increase in depth of the bar channel that year over that of 1885, the "Middle Sands" had practically disappeared. In 1890 the channel depth was 24 feet; in 1891, 27 feet; in 1892, 28 feet; in 1893, 29 feet; in 1894, 29 feet, and in 1895, 31 feet.

Condition of channel since 1895.—Since 1895 the bar channel has gradually decreased in depth as well as moved farther northward at its sea end. The survey of 1896 showed a narrow bar channel with but 30 feet of water in it. In 1897 the conditions
81 were the same. In 1898 the depth had decreased to 29 feet, and in 1899 it is only 28 feet. The direction of the 1899 channel at its sea end is northwest, a further movement northward since 1895 of 2¼ miles and since 1885 of 5¾ miles.

The portion of page 15 of said volume offered in evidence reads as follows:

"*Harbor.*—The examination of a chart of the Pacific coast will show that on the coast line between San Francisco and the straits of Fuca the only harbor for deep-draft vessels is at the mouth of the Columbia River. It lies directly in the track of nearly all coast shipping north and south, and is an available harbor of refuge for this shipping and other vessels seeking a port. It has great accessibility, and the direction of the coast line, with the gradual slope of the ocean bed from the shore, is favorable for vessels standing close in when making port.

The Columbia River is important not only on account of the present as well as the growing industrial and commercial interests of the Pacific coast, but also for its strategic position and consequent importance, from a military and naval point of view, as a base of

operations communicating with the interior by several great railroad systems.

It is a fresh-water harbor free from the ravages of *teredo navalis*. It has ample depth and anchorage area, with good holding ground, is always free from ice, and by the construction of the jetty is fully protected from the ocean swell. The direction of the prevailing winds during the stormy season of the year is from the south-
82 east and southwest, and the axis of the bay being about east and west it will be seen that the harbor is well sheltered by the jetty and the mainland from the effects of these storms, and they also furnish a sufficient protection for the deep and extensive anchorage ground of the bay.

The harbor inside of the jetty and extending to Astoria available and used for anchorage purposes, covers an area, over which the depth is from 24 to 70 feet at low water, of 7,820 acres, or about 12 square miles, and for a depth of 30 to 70 feet 5,030 acres, or 7.86 square miles."

Mr. MACDONALD: The State of Washington offers in evidence pages 4 and 5, up to and including the paragraph reading: "The distance from Portland to the mouth of the Columbia River is approximately 110 miles, and the works proposed will be taken up in order, proceeding from Portland down. Broadly speaking, these works consist of dikes or dams, shore protection, and dredging."

The State of Washington also offers in evidence page 10, commencing at the paragraph entitled "*J. From Three Tree Point to the mouth of the Columbia River—Sheets 10 and 11,*" down to and including the paragraph on page 11, reading: "It is proposed also to dredge along the line L M, sheet 11, to aid in formation of the channel, and further dredging farther up in the crossing and near Pillar Rock, sheet 10. The dredged channel is made 400 feet wide, except near Pillar Rock; as there are no high banks to aid pilots in keeping their course, currents are more or less oblique to the channel, and hence more leeway is required."

The State of Washington also offers in evidence Sheets
83 *Sheets* 10 and 11, all of which contain a part of a survey of Lower Willamette & Columbia Rivers below Portland, Oregon, with a view to obtaining a channel depth of 25 feet at low water from Portland to the mouth of the Columbia River; this report being made by Major W. C. Langfitt, Captain, Corps of Engineers, U. S. Army, and transmitted through the proper channels to the Chief of Engineers of the United States Army, and by him transmitted to the Secretary of War, and which is found in House of Representatives Document No. 673, of the 56th Congress, 1st session; duly authenticated by the Chief of Engineers of the United States Army and the Assistant Secretary of War, under the seal of the War Department.

This volume was marked Washington's Exhibit F and signed by the Commissioners.

Pages 4 and 5 of said volume, so far as offered, read as follows:

"Survey of Lower Willamette and Columbia Rivers, Below Portland, Oreg., with a View to Obtaining a Channel Depth of 25 Feet at Low Water from Portland to the Mouth of the Columbia River.

UNITED STATES ENGINEER OFFICE,
PORTLAND, OREG., *April* 12, 1900.

GENERAL: The river and harbor act of March 3, 1899, authorized, among other examinations and surveys, one as follows:

Lower Willamette and Columbia rivers below Portland, Oregon: Survey and estimate of the cost of obtaining a channel depth of twenty-five feet at low water from Portland to the mouth of the Columbia River.

Report of preliminary examination made by Major Fiske, Corps of Engineers, my predecessor in charge of this district, was submitted by him under date of April 6, 1899. This report states that the improvement was one worthy of being undertaken by the General Government, and survey was authorized by letter from Office
84 Chief Engineers, dated August 25, 1899.

This is the second preliminary examination and survey which has been made with this same object in view, viz, a 25-foot channel from Portland to the mouth of the river. The first one was required by the River and Harbor Act of September 19, 1890, and report of survey was submitted by Major Handbury, Corps of Engineers, under date of September 8, 1891. The reports of the preliminary examination and of the survey, together with maps and plans, are printed in House Executive Document No. 38, 52nd Congress, 1st Session. In his report on the survey Major Handbury submits an estimate of cost of obtaining the required channel, the work recommended consisting of dredging and dike construction.

It is but proper to state that of the dike work recommended in his report, of which the estimated cost aggregated $443,420, the United States only repaired the St. Helen's dike and constructed Martin Island dike, the estimated cost of both of which was $43,000. From funds on hand the dike on south side of Swan Island was raised to 4 feet elevation.

The Port of Portland Commission, under permission from the War Department, which permission expressly relieved the United States from any obligation or claim for reimbursement in respect thereto, constructed the remainder. The dredging recommended by Major Handbury was never systematically carried out, work being done at different places as a rule, as the exigencies of the moment demanded. The works constructed and the dredging had resulted in maintaining a fairly good channel from Portland to the mouth of the Columbia of from 20 to 23 feet depth at low water.

The present state of the river is shown in the maps accompanying this report, and it is believed they cover all stretches of the river where works will be necessary for a considerable length of
85 time. Greater depths are shown on these maps than would have been the case could the survey have been made in July and August, immediately after the summer rise of the Columbia.

The winter freshets scour out the bars formed by the summer one, and a dredge has been maintained in constant work by this office dredging at various places as needed. In addition, the dredge of the Port of Portland Commission has done much work in the harbor of the city, at the mouth of the Willamette River, and at Willow Bar. These facts have been taken into consideration in laying out the works regarded as necessary, to the accomplishment of the end in view. The limits of the surveys at the different places have had to be extended beyond the particular shoal under consideration, as in formulating a proper plan the river above and below must also be considered.

The works done in the past have produced great improvement in the river, so that now ships drawing from 20 to 24 feet ascend to Portland, where formerly 15 to 20 feet draught was the limit, while, going still further back, 10 to 12 feet was the limit at low water in the Willamette.

In view of the results already secured, if the cost be not prohibitive, the further deepening should be undertaken and a wider and better channel obtained. The tendency of modern deep-sea freight and combined freight and passenger vessels seems to incline to deeper draught and longer hulls, requiring wider and deeper channels for maneuvering. A port which cannot accommodate such ships will of necessity fall in importance.

The first step, then, is to determine the practicability and cost of the proposed channel. It should be remembered, if this cost prove large, that, generally speaking, in such rivers the cost per foot gain of depth will increase in much greater ratio than the
86 gain. And furthermore, that the depth here sought is much more than is usually demanded in river navigation.

The distance from Portland to the mouth of the Columbia River is approximately 110 miles, and the works proposed will be taken up in order, proceeding from Portland down. Broadly speaking, these works consist of dikes or dams, shore protection and dredging."

Pages 10 and 11 of said volume so far as offered read as follows:

"*J. From Three Tree Point to the Mouth of the Columbia River—Sheets* 10 *and* 11.—This stretch of the river is in the broad estuary of the Columbia and the main channel through it has never been fixed, but has been subject to shifting and changes.

No definite plan has ever been proposed for the permanent improvement of this reach, the improvement of the bar at the entrance of course excepted. That the tidal and river flow is ample to maintain one or more good ship channels is evident. Three possible courses for the main channel have been discussed in the past, one being to attempt opening the main channel along the line X Y, sheet 10, and maintain it there. Upon this it may be remarked that both banks of such a channel would be sand, not permanent in character, and exceedingly costly to fix in position. Unless nature herself should form the channel here—and this, in view of the history of the estuary, is improbable—it would seem to be bad engineering to attempt it. It will therefore not be further considered.

The second proposal is to create and maintain a channel down the

north shore from Three Tree Point to Harrington Point, thence to the deep water leading down past Point Ellice, line U V, sheet 10. The third proposal is to allow the river to cross the
87 estuary, leaving the north shore somewhere between Three Tree Point and Harrington Point, the channel running thence in a generally southwesterly course to the south shore at or below Tongue Point. In the early years, after the discovery of the river, there used to be a fair channel following the second course outlined above, the Coast Survey chart of 1851 showing 21 feet carried through to deep water at Point Gray, and the Vancouver map of 1792 shows this carried through past Harrington Point, and the chart of 1839 shows a good channel along the south shore to Tongue Point. Large changes have taken place since then, and for many years the channel has followed the south shore to the latter point, thence crossing in a northeasterly direction to the north shore.

If the channel can be fixed along the north shore from Three Tree Point to Harrington Point, thence crossing the estuary in a southwesterly direction to the south shore, somewhere below Tongue Point, thence following the south shore to the entrance, many advantages would accrue. In the first place, except for the crossing, the channel will always have one firm fixed bank against which to hold it; in the second place, the Snag Island dike, already constructed, can, in part, be utilized; in the third place, the channel will pass Astoria, the only place of any importance at all at the mouth, and, lastly it is believed that such a scheme will conform to and be in line with, as far as possible, the tendency of the natural forces. It is proposed, therefore, to construct, first, a sill of mattress and stone projecting out from the Snag Island dike, to prevent cutting, past and practically parallel to the latter dike, A B, sheet 10, then to prolong the main dike up stream, C to D, raising its elevation to a height to be determined by noting the results ac-
88 complished, but probably to low water. These works will cause the shoal below Pillar Rock to scour away and maintain the channel along the north shore to the vicinity of Harrington Point. The head of Prairie Channel should be watched, and if it shows signs of deepening too much a sill should be constructed across from the head of Woody Island to Cathlamet Point. To fix the crossing it is proposed to construct a low dike extending from Harrington Point in a southwesterly direction E F, sheet 10, to the sands. It is believed the additional water thus forced by all these works through this crossing will maintain, with but little annual dredging, a good channel to the junction of the crossing with the deep water below Tongue Point. The advisability of constructing a sill from G to H to prevent the water being diverted between the two shoals was considered, but such a sill is hardly believed necessary, though it is thought proper to mention the possibility of its necessity.

Dredging.—To connect the deep water below Tongue Point with the channel along the south shore it is proposed to dredge a channel along the line I K, sheets 10 and 11, the latter sheet showing the condition of river in the vicinity on a larger scale. The incipient

channel shown along this line has been developing steadily in the past 8 or 10 years. During the same time the channel by way of the Buoy Depot and Sylvia de Grasse Reef has shown some deterioration. Moreover, the latter channel can not be made satisfactory at moderate cost. It is narrow, and the presence of the reef is an ever-present menace to navigation. Any broad and sufficient channel along this shore, if dredged through, could not be maintained except by large annual expenditures, and especially is this true for any channel so far from the shore as to leave the reef to one side. To
89 remove the reef itself would be extremely expensive, there being some 138,000 cubic yards of rock outside the harbor lines of Astoria, which at least calculation would cost $828,000 to remove. And again such channel would be more crooked and longer. The advantages to be gained promise to be greater from the location selected. Moreover, the latter is almost directly in prolongation of the line of crossing now followed by the river, and will, it is believed, increase the tidal flow in and hence render easier the maintenance of the Astoria channel from and below the junction of the two.

It is proposed also to dredge along the line L N, sheet 11, to aid in formation of the channel, and further dredging farther up in the crossing and near Pillar Rock, sheet 10. The dredged channel is made 400 feet wide, except near Pillar Rock; as there are no high banks to aid pilots in keeping their course, currents are more or less oblique to the channel, and hence more lee-way is required."

Mr. MACDONALD: The State of Washington offers in evidence page 2275, commencing with the heading "Report of Board of Engineers on Project for Improvement of Mouth of Columbia River. United States Engineer Office, New York, N. Y., January 24, 1903," and pages 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, and 2291, as far as and including the sentence: "In this case, with the loss to the beach of a part of the supply that maintained it, the northerly drift across the entrance should be less in volume in the future than in the past,"—being a portion of a report of Board of Engineers to the Chief of Engineers of the U. S. Army, transmitted through the usual military channels to the Chief of Engineers of the U. S. Army; and also, com-
90 mencing on page 2305, "Appendix A. Description of the Entrance to the Columbia River, as shown by different surveys,"—down to and including the first paragraph on page 2318, which reads: "No change occurred in the main channel at the gorge, the conditions at the point being practically identical with those existing in 1899 and 1901 with the exception of a deepening, most pronounced opposite the end of the jetty." We do not desire to introduce, however, any of the maps which appear between pages 2316 and 2317. The report of the Board of Engineers and Appendix A, from which we offer in evidence certain portions, is contained in the Annual Report upon the Improvement of Willamette River, and of Columbia River, below the Mouth of Willamette River, and their tributaries, Oregon and Washington, in the charge of W. C.

Langfitt, Major, Corps of Engineers, U. S. A.; being Appendix XX of the Annual Report of the Chief of Engineers for 1903, and printed at Washington by the Government Printing Office in 1903; duly authenticated by the Chief of Engineers of the U. S. Army and by the Assistant Secretary of War, under the seal of the War Department.

The volume was marked Washington's Exhibit G, and signed by the Commissioners.

Pages 2275, to 2291, of Washington's Exhibit G, read as follows:

"Report of Board of Engineers on Project for Improvement of Mouth of Columbia River.

UNITED STATES ENGINEER OFFICE,
NEW YORK, N. Y., *January* 24, 1903.

GENERAL: Paragraph 11, Special Orders, No. 19, Headquarters, Corps of Engineers, U. S. Army, July 5, 1902, constituted a Board of Officers of the Corps of Engineers, consisting of three
91 members, "to consider and report upon the propect for improving the mouth of Columbia River, Oregon and Washington." By Special Orders, No. 35, same headquarters, September 13, 1902, the Board was increased to five members by the addition of two officers.

Pursuant to the above orders, and the call of the senior member, the Board met at Portland, Oreg., September 18, 1902, for the consideration of the adopted project for the improvement of the Columbia River. * * *

Proceeding to the mouth of the Columbia River the Board made an examination on September 19 of that locality and of the jetty heretofore constructed for its improvement. On September 20 the Board held a public hearing in Portland, Oreg., at which all interested parties were given an opportunity to present their views, and on the same day adjourned to meet in New York City on October 14, 1902, in accordance with instructions from the Chief of Engineers, dated August 19, 1902. * * *

Pursuant to this adjournment the Board met in New York City on the date named * * * The Board afterwards proceeded to Aransas Pass, Tex. * * * On January 12, 1903, the Board again assembled in New York City and remained in session until the consideration of the business before it was concluded.

After a thorough and careful consideration of the subject before it, the Board has now the honor to submit the following report. * * *

The order constituting the Board requires it only "to consider and report upon the project for improving the mouth of the Columbia River, Oregon and Washington," without requiring an expression of opinion as to the desirability of continuing that improvement. In view of the recommendations contained in the following report, the Board feels no hesitation in expressing its opinion of the importance

and necessity of the proposed improvements without enter-
92 ing into any explanation of the well-established facts upon which that opinion is based.

The project referred to the Board for its consideration is that proposed by Maj. W. C. Langfitt, Corps of Engineers, in accordance with a provision contained in the river and harbor act of March 3, 1899, as follows:

Mouth of Columbia River, Oregon and Washington: Survey and estimates with a view to obtaining a channel of forty feet depth at lowest low water, and a report as to the desirability of such improvement.

Major Langfitt's project is contained in his report of November 6, 1899, as printed in House Document No. 94, Fifty sixth Congress, first session, and reprinted in the Annual Report of the Chief of Enginers, United States Army, for 1900, pages 4430-4453. This project received the approval of Congress by the appropriation of $250,000 contained in the sundry civil act of June 6, 1900:

For the repair of the jetty at the mouth of Columbia River, Oregon and Washington, including repairs to wharves, approaches, tramway, plant, quarters, and buildings, and contingent expenses.

It was again approved by Congress in the item of the river and harbor act of June 13, 1902, for—

Improving the mouth of Columbia River, Oregon and Washington: Continuing improvement in accordance with the latest approved project and such modification thereof as may be approved by the Secretary of War, five hundred thousand dollars: *Provided,* That a contract or contracts may be entered into by the Secretary of War for such materials and work as may be necessary to prosecute the approved and modified project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one million dollars, exclusive of the amounts herein and heretofore appropriated: *Provided further,* That such modifications shall not cause the total cost of the work to exceed that of the latest approved project.

An elaborate description of the entrance to the Columbia River does not appear necessary in view of its well-known character, and only its most prominent characteristics will be mentioned at
93 present. Such physical facts as relate to the question of its improvement will be taken up later in detail.

Description of the Columbia River Entrance.

The entrance to the Columbia River lies between a high rocky headland, Cape Disappointment, on the north and a low sand point, Point Adams, on the south. Joining these two points is the Columbia River bar, which, measured along its crest, has had lengths of from 10 to 12 miles from point to point. The projection of the bar seaward from a north and south line, through Cape Disappointment light, was 2¾ miles in 1881 and 3⅜ miles in 1902, the distance in each case being to the outer 30-foot contour.

Point Adams is the northern extremity of the beach that extends up the coast from Tillamook Head, the headland next south of the entrance and distant 23 miles from Cape Disappointment. Point Adams has been unstable in position and in 1881 was about 6 miles SSE. of Cape Disappointment. From Point Adams there has always extended in a NNW direction a shoal, Clatsop Spit, whose length and area has varied greatly from time to time with the position of the channel or channels. By the construction of the existing jetty Clatsop Spit was gradually raised above high water nearly to the jetty end and has become an extension of Point Adams. The shore line has thus been advanced about 3 miles since 1889 and the entrance contracted to that extent. The end of the jetty has, in fact, become the south point of the entrance in so far as concerns the future improvement of the bar channel.

About Cape Disappointment also there have always been shoals, Peacock Spit, that have likewise varied widely in extent and area. East of Cape Disappointment lies Bakers Bay, which has at times been in part occupied by the channel, but which since 1885
94 has been of little depth throughout. Sand Island occupies a large part of the channel face of Bakers Bay and the Chinook Spit, of the earlier survey, lies at its eastern end.

Between the north and south spits there have ordinarily been found intermediate shoals known as the Middle Sands, which have been connected at different times either to Peacock Spit, when but one channel existed (1885) or to Sand Island when there were two channels (1868).

At Point Adams the width of the river between the Fort Stevens wharf and Chinook Point is about 3 miles. Upstream from Point Adams there are much greater widths occupied by shoals and numerous channels. All existing survey records show the Point Adams section occupied by two channels, between which lies the Middle Ground, whose downstream end, as shown by the 13-foot contour, is three-fourths of a mile below the Fort Stevens wharf and has not changed materially in position since 1868. Of these two channels the southerly or Fort Stevens channel has always been, so far as is known, the ship channel leading to Astoria and the upper river. The northerly or Chinook Point channel leads into many smaller ones that become lost in the shoals above. Below Point Adams the channel conditions have varied largely in the last century, although there is shown by all the surveys a junction of the two channels, or at least a passage between them (1839). At this junction there existed until after the present jetty was constructed a shoal across the Fort Stevens channel on which the depth has been as little as 18 or 19 feet.

History of the Entrance.

The earliest known chart of the entrance is a sketch made by Admiral Vancouver in 1792. The other known early surveys were by Sir Edward Belcher in 1839, Captain Wilkes in 1841,
95 and the United States Coast survey in 1850, 1852, and 1868. Surveys or examinations have been made by the Corps of

Engineers, U. S. Army, in each year since 1875, excepting 1877, 1884, 1887 and 1888.

The 1792 map shows the junction of the two inside channels and a single channel running almost due west to the sea, with a deep pocket making north into Baker's Bay, close under Cape Disappointment. Across the bar there is shown a depth of 27 feet and on the Fort Stevens bar a depth of 18 feet. Clatsop Spit appears with a very large development to the north and to the west, particularly to the west, while Peacock Spit extends but a short distance south of Cape Disappointment and not so far to the west as Clatsop Spit. This map is made on a small scale, without much hydrographic detail, and the plane of reference for the soundings is unknown.

The 1839 survey resulted in the first complete chart of the entrance. The plane of reference to which its soundings were reduced is unknown, but was probably a- low water. This survey exhibited a marked change since 1792. The two channels in the Point Adams-Chinook Point section remained practically unchanged, but each was prolonged to the sea by a separate channel. The Point Adams channel extended almost due west as a south channel, pointing to the southwest on the bar crossing where the controlling depth was 19 feet. The north channel ran from Chinook Point northwest through Bakers Bay to Cape Disappointment. East of the Cape it bent abruptly toward the south and thence to the southwest, in which latter direction it crossed the bar with a ruling depth of 27 feet. The north channel was wide and deep, with depths not less than 36 feet from Chinook Point to the bar and maximum depths of 84 and 90 feet inside the Cape. The shoals between the two channels extended continuously from the Middle Ground to the sea. Their most prominent features were the Sand Island shoals which were located across the center of the entrance and extended in a northwesterly direction from the Middle Ground to within three-fourths of a mile of the Cape. Across these shoals and between them and the Middle Ground was a connection between the two channels on which the depth was 25 feet. Between the sea ends of the two channels were the Middle Sands, extending 4 miles in a southwesterly direction almost at right angles to the Sand Island shoals, with which they were connected. These Middle Sands had ruling depths over them of from 15 to 18 feet excepting at one point, 2 miles from the sea, where the depth was as much as 24 feet, and a 21-foot connection existed between the north and south channels. The Middle Sands were submerged to depths of 2 or more fathoms and no part of the Sand Island shoals reached to high water. Clatsop Spit extended west from Point Adams, and but very little north of it. Peacock Spit extended nearly 3 miles in a SSW. direction from Cape Disappointment to the north channel. No development of the shoalest parts of these spits was made by soundings and their relative heights are indeterminate.

The above description of the entrance, as it existed in 1839, is given this much in detail for the reason that, excepting for the pro-

gressive changes noted hereafter, it is typical of the two-channel condition that continued for forty years and until after 1880.

By 1850 the two inside channels had made a junction between the Middle Ground and Sand Island shoals with deep water in each channel. The south channel had deepened inside the bar and moved to the north, but west of Sand Island it ran southwest to the sea with but 19 feet depth across the bar. The north channel through Bakers Bay retained about the same position but had shoaled to 2[illegible] feet. From Cape Disappointment it ran SSW. to the sea
97 parallel to and 2½ miles from the south channel, from which it was separated by the Middle Sands. The latter had shoaled materially and showed on the chart as a long tail extending SSW. from Sand Island. Sand Island shoals had shortened and moved northwest nearer the cape. Clatsop Spit had grown toward the northwest and lost on the west, while Peacock Spit showed no marked change. The soundings of the 1850 survey are reduced to mean low water and of the 1852 and all later surveys to the plane of the mean of the lower low waters.

The changes in progress during the 1839-1850 period continued to 1868. Clatsop Spit had increased greatly in importance and assumed the shape so well known from the later surveys. It had extended 1 mile northwesterly and shoaled over its whole area, excepting where crossed by a swash channel close to Point Adams. With the growth of Clatsop Spit the south channel and Sand Island, which had risen above high water, were pushed to the north. The former ran to the west past Sand Island and then bent to the south in a quadrant of a circle, being wide and deep inside the bar and having a wide bar crossing with a best depth of 27 feet. The Middle Sands extended west from Sand Island and then south parallel to the south channel. They had lost in width but had apparently gained in elevation. The north channel had deteriorated throughout and had a depth of 21 feet both in Baker's Bay and on the bar. Passing Cape Disappointment, it ran SSW. and thence SW. along the north face of the Middle Sands and across the bar. With the extension of Clatsop Spit there had formed across the mouth of the Point Adams channel a shoal that connected the Spit with the Middle Ground and continued to obstruct that channel until the jetty was constructed.

The 1868 survey shows the south channel in its best condition. With the continued growth of Clatsop Spit the south channel was pushed still farther north with a resulting corresponding
98 movement of Sand Island and the gradual obliteration of the Middle Sands. By 1881 the Middle Sands, as they existed in 1868, as an effective barrier on the north of the south channel, had almost disappeared and a breach had been made through them connecting the two channels. During this period Clatsop Spit had lost in elevation and had failed to follow the south channel in its widening to the west. As a result of these two causes the south channel had deteriorated and covered the entire southwest quadrant of the bar, although its best depth, 19 feet, was found in a southerly direction near Clatsop Spit. The north channel had deepened on the

bar crossing (23 feet in 1878-79) and 21 feet in 1881), where it pointed to the NW. after running SSW. past Cape Disappointment, but in Bakers Bay it had shoaled to 14 feet and ceased to be used as a channel.

The above channel history may be summarized in a few words Clatsop Spit subsequent to 1839 steadily increased in length, area and elevation, reaching its maximum elevation probably about the time of the 1868 survey, but continuing to lengthen to the end of this period, 1881. The south channel, assumed to be the development of a swash channel across an earlier Clatsop Spit, moved north with the growth of Clatsop Spit while its outer end remained in about the same position as in 1839, the bar crossing always pointing to the south of west. It increased in depth to 27 feet in 1868 and then deteriorated again to 19 feet in 1881, with the changes in Clatsop Spit and the Middle Sands. The island shoals, assumed to be the detached remnant of an earlier Clatsop Spit, moved steadily north and increased in elevation but decreased in area. The Middle Sands, trailing seaward from the Sand Island shoals, increased in area to 1851 and in elevation to 1858 and decreased in each subsequent to those dates. The north channel, which in 1839 was wide and deep through Baker's Bay and carried 27 feet across *across* the bar, 99 steadily deteriorated throughout after 1852, shoaling to 19 feet at both ends. It retained its southwest direction across the bar until the later seventie's, and then swung around to the northwest. Peacock Spit retained its position practically unchanged during the entire period, but in 1881 it had but two-fifths of its maximum length of 1851.

In 1882 a project for the improvement of the entrance was prepared by a board of engineers under authority contained in the act of August 2, 1882. The report of this board was printed in Senate Executive Document No. 13, 47th Congress, second session, and in the Report of the Chief of Engineers for 1883, pp. 2011-2037. This report, and the works recommended therein and by a later Board (1893) will be considered in detail subsequently.

After 1881 the north channel continued to deteriorate and by 1885 it had practically disappeared. Since that time there has been but one channel, the old south channel, which retained without material change its location and depth across the southwest section of the bar until 1889. Clatsop Spit continued to grow to the north and west until even a later date, but lost in elevation until reinforced by the construction of the jetty. Its most marked development was the appearance in or before 1881 of a new swash channel near Point Adams, which continued to grow in width and depth until after 1885 and promised, if not checked, to develop into a new south channel similar to that of 1839. Sand Island and the channel north of Clatsop Spit were pushed farther north, and this movement continued until the sand movement on Clatsop Spit was controlled by the construction of the jetty designed by the Board of 1882. The Middle Sands as and appendage to Sand Island disappeared, but remained as the outer crest of the bar and a barrier directly across the

entrance. Peacock Spit to 1889 gradually shortened in a
100 north and south direction, but grew extensively to the southwest along the crest of the bar. Baker's Bay became an area of shoals and has so continued to the present time.

The project of the Board of 1882 provided for a jetty running northwesterly across Clatsop Spit. Its construction was begun in 1885, but proceeded so slowly as not to affect the condition of the bar channel until 1889. Rapid construction commenced in 1899 and its effect on the bar was immediately noticeable. The channel, which since 1881 had hugged the western side of Clatsop Spit, straightened out toward the west, although all of the southwest quadrant of the bar was of nearly uniform depth. As the construction of the jetty proceeded the channel continued to swing toward the north and increase in depth progressively until 1895, when it had a maximum depth of 31 feet and a channel depth of 30 feet for a width of seven-eighths of a mile. At this time, 1895, the channel ran almost due west from Sand Island to the bar and was in its best known condition. The swing to the north continued, however, and the depth decreased slowly to 28 feet in 1899, and then rapidly to 24 feet in 1900, 23 feet in 1901, and 22 feet in 1902, by which time the remains of the old bar channel pointed nearly due north and two new channels of almost equal depth had become apparent. During this swing of 6 miles from the southerly location of 1885 and of 4 miles from the southwesterly position of 1889 the channel across the bar pointed persistently toward the southwest until 1897. Between 1897 and 1898 a marked change occurred, and the bar channel swung through an arc of 60° to the northwest, followed by the rapid deterioration in depth that occurred after 1899.

During this period of jetty construction from 1889 to 1895 and the subsequent period of channel deterioration after 1895 many changes in the physical chracteristics of the channels, spits, and the crest of the bar were making progressively. A discussion of
101 them in their relation to the improvement of the entrance will be found below. A detailed description and history of the entrance, compiled from the records of surveys as shown on existing charts and in extension of a similar description accompanying the report of the Board of 1882, is attached hereto (Appendix A), with a tabulated statement of the depths on the inner and outer bars as shown by the charts of the various surveys.

Physical Data.

From Cape Disappointment the beach is continuous for 23 miles to Tillamook Head with the exception of the break made by the mouth of the Columbia River. From Tillamook Head to within about 5 miles of Point Adams the beach accumulation of sand is comparatively narrow, with high bluffs within 1 or 1½ miles of the coast line. The river is confined between rocky, permanent banks at the Astoria-Point Ellice section, 5 miles east of Point Adams, and the limits within which it has been possible for the entrance to shift are restricted therefore to the 11-mile section south or southeast of

Cape Disappointment. Since 1792, and probably a much earlier date, the entrance has been confined to the 6-mile section south of the cape, and within this section its channels have varied widely in position. The ocean beach and bed in the vicinity of the Columbia river entrance and the many spits, bars, and shoals, both within and without that entrance, are composed of a fine sand that is readily shifted from point to point by the prevailing currents, particularly when placed in suspension by the action of the incessant surf of this coast. It is thus molded into shapes whose configuration best indicates for the time being the resultant of the forces that lead to sand movements.

The origin of this sand is not susceptible of exact determination.
Part of it is undoubtedly due to the slow degradation of the
102 coast cliffs by wave action and other causes, but there appears to be no reasonable doubt that the bulk of it was originally brought from the interior by the Columbia River, which drains an immense area and is the only large stream between San Francisco and the entrance to Puget Sound. The Columbia is not ordinarily classed as a sediment-bearing stream. For the greater part of the year its waters are clear, but during periods of freshets, which are usually of several months' duration in each year, it carries material in suspension and pushes more along its bed. This material forms the bars and shoals that exist in the upper river and encumber so extensively its lower portion, finally and progressively reaching the sea. Evidence of this origin of the sand is found in the general map of the cost from Cape Lookout north 110 miles to Gray's Harbor (U. S. Coast and Geodetic Survey, No. 6100). Between Cape Lookout and Tillamook Head, a distance of 40 miles, there are the mouths of several of the small coast streams, but the beach is uniformly narrow with no marked protuberances, and the 30-fathom contour remains at an almost uniform distance of 3 miles from the coast. Passing Tillamook Head, the 10 and 30-fathom contours gradually push out from the coast, the latter to a distance of 8 miles opposite the Columbia River entrance and of 9 or 10 miles at a point 12 miles north of Cape Disappointment; this last distance is maintained to the limits of the chart. The beaches also increase in importance to the north, and submerged bars project prominently at the Columbia River, Shoalwater Bay, and Gray's Harbor. These indications not only point to the Columbia River as the origin of the major part of the beach sand, but they also indicate that the bulk of this Columbia River sand ultimately drifts to the north after
reaching the beach. While the amount of this sand is enor-
103 mous when expressed in figures, it nevertheless is relatively small in comparison to that found on many other beaches and about the entrances of sediment-bearing streams of the size of the Columbia. Moreover, the shifting sand about the Columbia River entrance appears to be limited in amount, and not to be increasing to a troublesome extent by additions from the river or from the beaches to the south of Tillamook Head. Indeed, the Board believes that the majority of the changes on the spits and beaches about entrance during the last 40 years can be reasonably accounted for as

due to local movements of sand already in existence between Tillamook Head and Mackenzie Head, with the addition of such as is annually brought down by the river. Further consideration will be given subsequently to the details of this sand movement. As is the case in all similar ocean bars the active forces that shape the spits and channels forming the Columbia river entrance are the discharge of the river, the inflow and outflow of the tide, and the littoral and surf currents and waves produced by the winds.

Tidal and discharge flow and currents must be considered together, since in their action they are united. No very accurate data are at present available as to the quantities of river and tidal flow. There are two tides daily, usually of unequal height, the higher high tide being followed by the long run out to the lower low tide. The mean tidal range at Point Adams is 7.4 feet with maximum tides of 9.5 feet. At extreme low water the effect of the tide is perceptible to distances as great as 150 miles from the sea. The lower part of the river is a wide tidal estuary. The average rate of tidal outflow is estimated at approximately 1,200,000 cubic feet per second on mean tides of 7.4 feet and at 1,500,000 cubic feet
104 per second on maximum tides of 9.5 feet. The maximum rate of ebb on these tides may be roughly estimated at 2,400,000 and 3,000,000 cubic feet per second, respectively. No accurate determination of the fresh water discharge from the Columbia River appears to be available. Estimates, based on more or less complete discharge measurements, have been made of a fresh water discharge of from 90,000 to 120,000 cubic feet per second at low stages of the river, of 300,000 cubic feet at ordinary flood stages, and of 1,200,000 to *500,000* 1,500,000 feet during great freshets.

The maximum velocities of ebb currents in the channels are variable. Off Point Adams velocities of 4.5 miles per hour have been observed, and on maximum tides velocities as high as 6 miles per hour are claimed by the pilots to be attained near the end of the present jetty. Superficial observations alone indicate the existence of exceptionally strong tidal currents, and these indications are confirmed by the magnitude and conformation of the interior channels.

It is evident that the tidal flow usually predominates greatly over the fresh water flow in volume and in the frequency with which its maximum values recur, but the latter is of great importance in any project for the improvement of the entrance. Where the fresh-water flow is negligible and there is an equality of volume between the flood and the ebb flow it is frequently found that the maximum velocity of the ebb current materially exceeds the maximum velocity of the flood, with a corresponding increase in scour in the right direction—seaward.

The fresh-water flow for the 6 hours of flood tide lessens by its amount the quantity which must come in over the bar to fill the basin, and thereby decreases the capacity of the flood to
105 carry sand into the entrance. In addition, it also fills the basin more completely and increases by its own discharge the quantity of the ebb flow from the emptying of the basin alone. From these causes there follows a preponderance of the ebb over the

flood flow and an increase of ebb velocities above those that would occur with an equality of flood and ebb volumes. It is well known that the scouring and transporting powers of currents increase much more than in direct proportion to an increase in velocities. These facts place at the disposal of the engineer almost unlimited power to produce deepening at the mouth of the Columbia, and any form of contraction will deepen the channel across the bar. The best plan will be determined by questions of cost and permanence of results.

Within the gorge the direction of flow of the ebb and flood currents is determined by conditions other than any tendencies to set generally in any one direction. On the bar the set of the main channel ebb at all seasons is to the southwest at the first of the ebb and to the west southwest after the first of the ebb, attaining velocities of from 2½ to 5½ miles per hour. The set of the flood for all but summer conditions is toward the north with south to west winds, and attains velocities of 1½ to 3½ miles per hour. With south to east winds it is toward the north northwest with the same velocities. Under summer conditions and northwest winds the set of the first of the flood is toward the south, and of the main flood is toward the south southeast with velocities of 1 to 1½ miles per hour. All of these bearings are from the true meridian.

The severe storms of this coast occur during the winter season, from November to April, and are known as "southeasters." Beginning in the southeast they veer around to south and southwest, blowing out when they reach the northwest. These storms
106 sometimes continue for days and are always accompanied and followed by an extremely heavy sea from the southwest. In fact these storms and seas are notorious for their heaviness and severity, and are probably equalled or excelled in this respect on few of the world's coasts. During the winter and spring there is in some years much northwest wind. The summer wind is from the northwest and is generally a good sailing breeze, occasionally increasing to a moderate gale. The summer conditions of wind and sea are not comparable in severity to those of the winter season, and, so far as concerns the sea, they frequently degenerate into a heavy ground-swell, rolling in from the west with its crest generally parallel to the coast. This swell alone is sufficient under the smoothest condition of the sea to produce incessant breakers on the outer spits where the depths are 12 feet at low water. The sea on this coast is never quiet, and the bar, when rated as "smooth" by the local pilots, is rougher than the Atlantic ocean bars under average half-gale conditions.

The combined action of tide, wind, waves, surf, and, perhaps, of off-shore currents, produces the littoral currents whose existence at the Columbia river entrance is generally accepted. These currents are variable in direction and intensity but with a marked resultant set toward the north of this locality. Much cumulative evidence from the drifting of buoys and other floating material from toward the north might be quoted in support of this fact but is unnecessary. Such evidence as may be found in the floor of the sea and in the form

and movement of the beach and sand spits will appear later in the consideration of sand movements. While the general set of the littoral current is toward the north, it ordinarily follows the direction of the prevailing winds and is toward the south in the summer and the north during the winter. During the winter storms its intensity is claimed by pilots and others to reach as much as 2 or 3 miles per hour, or even more. The southerly currents of the summer season rarely, if ever, reaches these velocities.

107

Sand Movements.

That the fine sand about the entrance to the Columbia River is, as previously stated, readily shifted from point to point by the combined or resultant actions of winds, waves, and currents, is an accepted fact. This sand movement is of the very first importance in the consideration of any project for the improvement of the entrance. The poor quality and instability in position of its bar channels can be primarily due to no other cause, and until the principles and forces governing this sand movement are thoroughly understood no project for combatting it with a view to a permanent betterment of the bar channel can be intelligently planned.

The Board has heretofore made a most careful and painstaking study of this subject in all its aspects. Its conclusions and the facts on which they are based will be stated in as few words as possible.

The movements of the beach sand up and down the coast can be determined only by their results and when considered in connection with the forces known to produce them. These results are the changes from time to time in the shoals and spits about the entrance, which indicate the resultant movement of the sand, and, by their configuration, the direction and intensity of the subsurface forces that produce them. These forces may be and have been sought to be determined by the measurement and observation of surface phenomena and such information as has been obtained from surface observations of waves and currents is confirmed by the forms and movements of the sand bodies themselves. The Board has therefore made in this connection a careful examination of all the charted records of this entrance and an exhaustive study of the records of this bar from 1881 to 1902. Surveys or examinations have been made in every year since 1881 excepting 1884, 1887, and 1888, and the record is therefore sufficiently complete and continuous to furnish a basis for definite conclusions. It covers the time during which the jetty was under construction and the channel was improving to its best-known condition, as well as the period of subsequent deterioration to its original condition, so far as concerns the depth of the bar channel. It also includes a sufficient time previous to the commencement of jetty construction to indicate the effects of unrestrained natural forces upon the sands of the entrance. Moreover, this epoch from 1881 to 1902 covers one entire cycle of the bar channel in its swing from the south to the north with its final dissipation.

108

The section of most active sand movement is well recognized to be the beach and the area of shoal water and surf immediately in front of it, where the sand, beaten back upon the coast by the waves and agitated by the surf, is so placed in suspension as to be capable of transportation by the surf and other littoral currents. With the incessant waves and surf of this locality, the sand of the beaches and fore-shore is always in motion and, with the prevailing northerly drift of the sea currents, is moving toward the north. Under these conditions the sand of the beach or beaches south of the entrance has, in its general effect, steadily moved to the north across the entrance. This movement carries it past Point Adams in a direction approximately in prolongation of the beach itself, and forms to the north of that point the spits that, while subject to many
109 changes of form and area, have been persistently in existence at all times. Passing Point Adams this sand drift has in the past been exposed to the dispersing effect of the ebb and flood tide currents of the entrance, and while some of it has bent toward the northwest, around the crest of the bar, the bulk has followed its original direction in prolongation of the Point Adams beach. Under the dispersing influence of waves and currents this stream of sand has been scattered to form the wide expanse of Clatsop Spit, but its prevailing direction has been shown by the persistence of the crest of the spit along its western face previous to the construction of the jetty. This crest was deflected toward the sea from a prolongation of the Point Adams beach line only so much as might be expected from the prevailing influence of the ebb currents across the spit.

Built up in this manner by continuous accretions from the south, Clatsop Spit had, so long as the drift of sand across it was uncontrolled, steadily encroached upon the channel and pushed it to the north, accompanied by a corresponding wearing away of its opposite bank. The point of greatest pressure upon the channel has been at the extremity of the spit's crest, bent inward by the influence of the flood currents from the southwest, and here has always been the gorge, the deepest and narrowest section of the entrance. The channel, or channels, when there were two, have exhibited a marked and continuous tendency to run out southwest to sea on the bar crossing. The only exceptions to this rule have been to the channel shown by Admiral Vancouver's chart, of 1792 (a sketch), and deteriorating channels that have worked around to a northwesterly position. Under natural influences alone, as during the period from 1859 to 1888, the northerly movement of Clatsop Spit and the gorge of the channel, unaccompanied by a corresponding movement of the bar crossing, resulted in an increase in channel length and
110 an increase in the flow across the spit, followed by a lowering of the crest of the spit and the development of swash channels that may have ultimately become new south channels.

With the construction of the jetty and the stoppage of the currents across Clatsop Spit the sand flow from the south continued north undisturbed in direction, and, aided by the sand beaten up by the sea from the area of shoal water hitherto maintained by the sand carried southwest to the sea by those currents and through the

south channels, has accumulated in the area protected by the jetty, establishing a new beach in prolongation of the old one, and creating near the end of the jetty a new south point to the entrance, 3 miles northwest from Point Adams. While this area was filling, the pressure on the channel at the gorge was removed and its northerly movement ceased. The wearing of the opposite north bank continued, but was exceeded by that of the south, so that the channel as a whole moved south while accommodating itself to the increased flow due to the elevation of the spit. Before the completion of the jetty, in 1895, the accumulation of sand began to overtop the work and again to encroach upon the channel, causing a resumption of the northerly movement. With the diversion of a part of this sand flow around the end of the jetty the gorge has been moved seaward to near the end of the work, and the amount of material passing over the jetty has been so reduced that the channel currents at the gorge have been able to control it. The northerly movement of the channel after 1895 was minor in extent and ceased in 1899, the midline of the channel then being still south of its 1889 position. Since 1899 this movement has ceased at all points far enough within the end of the jetty to be fully under the protection and control of
that work, and at such points the channel appears, so far as
111 may be determined from a period of three years, to have
become stable in position, depth and area. (Sec. XIX-XXVIII, pl. 40.)

The diversion of a part of the sand flow seaward toward the end of the jetty transferred the point of greatest pressure and the gorge towards that locality. The entire sand pressure upon the channel has, however, been extended over a greater length of the channel face and the increased currents have been able to control the encroaching sand without permitting any recognizable channel movement to the north. Beyond the end of the jetty the position and character of the channel are affected by other influences, but its north bank and the channel as a whole show no tendency to move to the north. The movement of both has, in fact, since 1895, been toward the south for that part of the channel within 1½ miles to the west of the jetty end, beyond which section there have been no continuous or well-defined limits to the channel.

The Board believes that the bulk of the prevailing drift of sand from the south has at all times traveled northwesterly over the length of Clatsop Spit to or near the gorge of the channel. Previous to the construction of the jetty it was pushed into the channel at that point and in part remained as an extension of the spit. A large part of it was, however, carried away by the strong currents that have always existed at the gorge, and together with the material scoured from the opposite north bank has been returned toward the sea by the preponderance of the ebb currents in volume and velocity. After passing the gorge these currents have always lost through dispersion their ability to transport the eroded material, and under the added opposition of the waves have deposited it temporarily on the crest or slopes of the bar. To this deposit has been

added such of the drift sand from the Point Adams beach
112 as was pushed seaward by the currents across Clatsop Spit, and subsequently carried around the crest of the bar by the prevailing currents. That the amount of this drift sand traveling around the crest of the bar was relatively inconsiderable is evident from the records of the entrance below.

The south channel of 1868 remained practically unchanged in position until 1888, its movement being slightly to the south and east, nearer to Clatsop Spit. Previous to 1868, and since 1839, there is an incomplete record of the movement of two channels, but the shifting of the north channel was evidently due to the pressure brought upon the middle sands and the south channel by the growth of Clatsop Spit, and the entrance to the south channel retained unchanged — its position from 1839 to 1888, although the gorge moved northward 3 miles in these fifty-nine years. This phenomenon also confirms the stated fact that the set of the main flood and ebb currents is in a northeasterly and southwesterly direction. Such northerly movements as occurred in channels previous to 1888 were due to the crowding of other channels south of them until, reaching the northwest quadrant of the bar, a sudden shift to the northwest occurred and a rapid deterioration followed.

The bulk of the sand that lodged on the bar came with the ebb tide from or through the gorge of the channel. To this was added such as found its way with the littoral current around the bar in deeper water or along its crest. Deposited on the crest or slopes of the bar, it has been shifted from place to place as the channels shifted in position and direction, slowly working to the north.

The construction of the jetty altered materially the conditions on the south side of the entrance. With a free path to the end of the jetty, the drift sand followed that course and built up a bar-
113 rier seaward of the work. In this it was aided by the sand that had been pushed seaward by the Clatsop Spit overflow, and which, unsupported or replenished by that overflow, was beaten back upon the beach by the waves or moved along the coast by the littoral currents. The prevailing ebb currents across Clatsop Spit previous to 1889 pushed seaward a part of the drift sand that was traveling north. Little of this sand was able to find its way along the crest of the bar across the ebb and flood currents of the prevailing south-channel entrances, but, with a part of the material brought out by the ebb, was deposited off these entrances or carried to the south and beaten back upon the beach by the waves, helping to maintain the supply upon the southern beach. With the construction of the jetty and the increased flow through the gorge, the channel was projected more directly westward to the sea, shifting during 1889 some 2 miles to the northwest, and leaving a sector of deep water all the way to Clatsop Spit. The 1889 location was maintained through 1890. Although the bulk of the drift sand was deposited in the jetty area, some of it, aided again by that brought out by the ebb or beaten up from the shoal area southwest of it by the sea, was carried around the crest of the bar. The straightening of the channel to the west weakened the currents across the southern bar sector

and enabled its crest to build up with sand from the sources mentioned. By 1892 its projection beyond the end of the jetty and the increasing elevation of this part of the bar crest were noticeable. By 1895 its crest had attained its greatest elevation, and the sand movement was pushing northward the bar channel, which had retained almost unchanged a due-west position during 1892, 1893, and 1894.

Between 1895 and 1896 this sand movement pushed the bar
114 channel nearly 1 mile to the north, shoaling it 1 foot from the maximum of 31 feet in 1895, and at the same time the bar crest near the end of the jetty lost in elevation. This loss was regained in 1897, while the channel remained unchanged in depth and position. By 1897 the bar channel had swung so far north that the southwesterly set of the ebb currents was becoming ineffective in maintaining the southwesterly direction of the channel-crossing over the crest of the bar, and with the continued pressure of the sand from the south it swung markedly, in 1898, to the northwest, its history since that time being that of all such channels—loss of depth and importance when the bar-crossing is not favorably situated for gaining full advantage from the prevailing set of the ebb and flood currents.

As the bar channel moved to the north of the 1894 and 1895 positions it not only began to lose the advantage just noted, but increased in length. As a natural result of these changes and of the prevailing current tendencies, the flow across the southern and western crest of the bar increased, followed at first by a pushing of that crest seaward, and, after 1897, by a marked reduction in its elevation. This reduction in elevation of the bar crest, by increasing the dispersion of the ebb currents, still more strongly interfered with the maintenance of the channel in its northern position. By 1902, it had nearly disappeared and the bar had almost uniform depths of about 20 feet for 7 miles of its crest, with depths at two points nearly as great as remained in the old channel.

An examination of the record of this bar by a comparison of all charts since 1839, and of a full set of cross-sections prepared from the charts since 1881, convinces the Board that, as previously stated, the bulk of the sand movements about the entrance are merely the local shifting of sands, with a resultant drift to the north and
115 an accumulation on the northwest quadrant. A merely casual examination of the charts since 1839 is a sufficient basis for this opinion, and the complete record since 1881 reenforces it. Admiral Vancouver's sketch of 1792, the only record previous to 1839, has little value in this connection, but supports the facts stated below, omitting consideration of the improbably long development of Clatsop Spit to the west shown on that sketch.

The limited projection of the bar beyond the general line of the coast is evidence that the amount of sand brought into this locality has been small compared to the existing active forces, and probably no more than those forces will be able in the future to disperse with no more than a moderate increase of the present projection of the bar into the sea and across the path of the littoral currents. In any case there has been no seaward extension of the southwest face of the

bar since 1839. At a point on this southwest face somewhat more than half way between the Point Adams shore line and an east-and-west line through the center of the entrance, the outer slope of the bar has held, with only minor variations, essentially the same position for the sixty-three years since 1839, notwithstanding the fact that during the first forty-nine years of this period the main channel and sometimes two channels have discharged into the sea across this section. During the past twelve or fifteen years the outer slope of this face has receded with the swing of the channel to the north of it, and even with the deepening on the bar crest of this southwest sector since 1897 the recession has been only checked and not reversed into an advance. In this connection, and in confirmation of the strong scouring and transporting power of the prevailing northerly currents and waves, it should be noted that all the
116 records show the outer bar slope to have been steeper at this point than at any other.

The changes in the shape and position of the bar slopes since 1881 are shown in detail on the cross-sections accompanying this report as plates 25 to 44, the locations of the sections being shown on plate 22. These sections show no change in the outer slope of Clatsop Spit from 1881 to 1885, but a progressive deepening outside of the 18-foot contour from 1885 to 1902, without, however, any material general change in the inshore slope of Clatsop Spit beach after its formation. The outer slope of the bar from Clatsop Spit to a west-northwest line advanced between 1881 and 1885—that is, under natural conditions alone. North of this west-northwest line the outer slope remained stationary, or receded slightly during the same period. From Clatsop Spit to a south-southwest line there has been no advance since 1885, but a general recession, the outer slope being in 1902 as much as one-half or three-fourths of a mile in rear of the 1881 location.

From a SW. line entirely around the bar to Cape Disappointment the outer slope has advanced since 1889. On a WSW. line it advanced nearly one-half mile between 1885 and 1889 and receded by 1895 to the 1885 location, a position retained to the present time. North of this WSW. line the outer slope advanced seaward at each section until 1895, but at none of them has there been any material advance since the general lowering of the crest of the north sector between 1889 and 1895. There has been a slight advance in the extreme northern slope since 1895, with the continued but less-marked lowering of the corresponding bar crest between 1895 and 1899 or 1901, but the outer slope *since 1895, with the continued but*
less-marked lowering of the corresponding bar-crest between
117 *1895 and 1899 or 1901, but the outer slope* opposite and immediately to the north of the gorge has receded slightly or remained unchanged.

These changes may be summarized as follows: The advance of the outer slope of the bar that was in progress previous to 1885 on the southerly sector was checked and followed by a recession after that date to a position inshore of the 1881 slope. The swing of the bar channel in the period between and including 1889 and

1902 around nearly the entire length of the bar's crest, accompanied or preceded by the lowering of that crest throughout, produced a seaward extension of the bar and its outer slope north of the northwesterly section line (Sections I-X pl. 33). Opposite the gorge this extension amounted to nearly three-fourths of a mile and in the northwest sector to 1 mile or more, of which in each case but little has been regained. (Pls. 25 to 32). Opposite the gorge this seaward extension ceased even while the deep channel of 1895 still crossed the bar at its locality, the 1895 slope being slightly in rear of the 1892 line. (Sections I-VIII, pl. 31.) On the WSW. line (sections I-IX, pl. 32.) the advance of nearly one-half mile in 1889 was regained entirely by 1892 or 1895, nothwithstanding a continued lowering of the bar crest to 1892, and the slope has since experienced no change in position with the variations in elevation of the bar's crest and inner slope.

It seems evident to the Board that the seaward projection of the bar since and including 1889 has been due to the pushing seaward of the sand previously deposited on the bar in the manner heretofore stated, and that once a channel has been produced at any point the seaward growth of the bar has ceased. It is furthermore evident that the seaward extension was least on the west and southwest sectors of the bar, and that on the WSW. sector this extension was subsequently regained, the outer slope retaining there now
118 essentially the same position as in 1885 and all the years since 1839. The force and value of these and other facts relating to sand movements will appear in the discussion hereafter of the various projects proposed for the improvement of the entrance.

While the above statements relate entirely to the prevailing northerly drift of the littoral currents and sand movements, the Board has not failed to consider the less-effective southerly currents and waves that exist under the conditions noted previously in this report. These currents and waves, to a minor extent, reverse at times the action of the preponderating northerly forces, but they do not affect the ultimate result excepting in its average rate. They have no doubt assisted in maintaining the supply of sand on the Point Adams-Tillamook Head beach and foreshore, and their *affect* in opposing or reversing partically the tendency of the bar to go towards the northwest is recognized.

The Board has considered as an important part of the problem before it such data as are available regarding the volume of the sand movement. From these data and the studies made by the Board (pls. 45, 46, and 47), it appears that there was between 1885 and 1895 an increase in the volume of sand about the entrance, a deposit taking place on Clatsop Spit on the southwestern bar sector and in Baker's bay and a lesser scour at other points. This movement during the period of jetty construction and of disturbance of normal conditions is of small importance compared wih results since 1895 and the establishment of the bar in its present position. The studies just mentioned show since 1895 a decrease in the volume of sand about the entrance and outside of a line joining Point Adams and Cape Disappointment. While there have been large movements of

sand in this area since 1895, the movements have been almost entirely of local character, with a positive decrease in volume.
119 The deterioration of the bar channel has been due not to any increase in the quantity of sand about the bar, but to local sand movements and to insufficient control of ebb and flood currents and of the northerly sand movement across the entrance.

It has been already stated that the Board believes the natural forces at this entrance to be sufficiently powerful to prevent, with suitably located structures, any material and permanent advance of the bar westward in opposition to the waves and across the path of the prevailing northerly currents. This opinion is based upon several observed facts, not the least important of which is the constancy or diminution in the volume of sand upon the bar proper regardless of the drift of sand from the south and the additions discharged by the river. It may be repeated here that these additions from the river are relatively small and the supply of drift sand comparatively limited. The beaches south of Tillamook Head are not of first importance and the indications from the general coast map (U. S. Coast and Geodetic Survey No. 6100) point to a small movement around that head and those to the south of it. Information has also been furnished to the effect that the beach south of Point Adams is receding, particularly at its southern end. Assuming to be correct this information, which is not based on surveys, it may be concluded that with the closing of the southern channels and the cutting off of the sand supplied by them to replenish the volume of the south beach, the supply from the south around Tillamook Head is insufficient to maintain that beach and its foreshore as in the past, and that the deepening noted in front of Clatsop Spit beach continues as far south as Tillamook Head. In this case, with the loss to the beach of a part of the suupply that maintained it, the northerly
120 drift across the entrance should be less in volume in the future than in the past."

Pages 2305 to 2318 of Washington's Exhibit G, so far as offered, reads as follows:

Appendix A.

Description of the Entrance to the Columbia River, as Shown by Different Surveys.

1792. Admiral Vancouver's chart.—This chart is made on a small scale and, without much hydrographic detail, shows a general entrance to the river in a due eastern direction of a width of 1½ miles between the 3-fathom curves. Drawing a line from the southern point of Cape Disappointment to the northern point of the present Point Adams, and measuring from the middle of this line 6 statute miles due west, a depth of 27 feet is found at the most western limit of the survey, which depth can be carried, according to the chart, into the river and into Baker's Bay. No channel is shown along what is now known as Chinook Spit.

This chart, "M. C. R. 3, U. S. Engineer Office, Portland," was

enlarged about 8 times, to a scale of 1/40000, and traced for comparison with surveys of later dates; it may be stated that perhaps not too much dependance should be placed upon the accuracy of the shore lines and 3-fathom curves. Relative distances of main points, as Cape Disappointment, Point Adams, Smith's Point, (then Point George) and Point Ellice, were found to agree moderately well, however, with corresponding ones upon the first United States Coast Survey chart.

The plane of reference for soundings is not known.

This early survey indicates that there was at this time a river discharge through a single channel, the 3-fathom curve of which on the north was about three-fourths of a mile south of Cape Disappointment. In the report of the Board of Engineers, February 12, 1881, when commenting upon this survey, it is stated
121 that "the striking feature of the existence of but one channel could not have been a matter of mistake."

1839. Sir Edward Belcher's admiralty chart.—This chart shows a hydrographic survey of great detail. It gives the middle sands in the shape of a triangle, the respective angles of which are north, east, and west; the northern angle approaches Cape Disappointment to within one-half a mile; the western angle is due south of Cape Disappointment, 2 and three-quarter miles, and the eastern is due north of Point Adams 1½ miles. From the east angle, and running northwest with the east side of the middle sands, is shown for the first time Sand Island, having a length of 1¾ miles.

It is around this triangular area of sands that channels lead to the river after having crossed the outer bar, which in the main channel is located 4½ miles from a line connecting Cape Disappointment with Point Adams.

Twenty-seven feet is the best water that can be carried over the outer bar; thence the channel passes through an opening from five and a half to eight fathoms deep and measuring a least width of 1 mile between the 3-fathom curves. The northern edge of this channel is 2¼ miles south of Cape Disappointment.

After crossing the bar from the westward, one branch of this channel turns around the southern point of the sand bank now known as Peacock Spit, runs in a southerly direction 3 miles to the north angle of the middle sands, turns about this angle to the southeastward and runs along to the east border of the sands 5 miles to its east corner, where it joins a straight channel called Queen's channel upon the chart. Queen's channel is a second branch of the main channel. It follows along the south border of the middle sands in a due east direction and has two entrances. One of them
122 is an opening at the western angle of the Middle Sands flat of a mile wide, with channel depths of 21 feet; the other entrance is from the southward by an opening from the sea 4½ miles west of Point Adams, with a depth of 19½ feet.

The junction of the long north channel with the shorter, or Queen's channel, at the eastern angle of the Middle Sands, is one-half of a mile wide, showing a least available channel depth of 25 feet.

The plane of reference to which the soundings were reduced is not given; the line of low water is drawn upon the chart, to which line the soundings diminish to zero. A high-water line is also shown. Sheet No. 2 (river sheet) gives a value for the establishment of the port, and states that the tide rises 7 feet and 6 inches. This is the height of the mean of high waters above the mean of lower low waters.

The chart "M. C. R. 4 United States Engineer Office, Portland," was reduced from a scale of 4 inches to a nautical mile to a scale of 1/40000, and traced for the purpose of comparing readily the conditions of the mouth of the river at times of this survey and other surveys.

1841. Chart of Captain Wilkes's exploring expedition.—This chart shows the position of the Middle Sands; the position of the long sand bank known as Peacock Spit, hinged to and extending 2½ miles southward from Cape Disappointment; Chinook Spit, extending in a northwesterly direction from Chinook Point, and the northern edge, 4-fathom curve, of what is known as Clatsop Spit, which line runs on a course almost due west of Point Adams.

The sand banks make two channels, viz., a direct one from the entrance south of Peacock Spit, running due east, bounded by the southern edge of the Middle Sands, and the northern edge of Clatsop Spit, and a channel running northerly between the east
123 edge of Peacock Spit and the west border of the Middle Sands, into Baker's Bay, turning here to a southeasterly direction between the east border of the Middle Sands and the 3-fathom curve of the northern shore; both channels join at the east angle of the triangular middle sandbank. Through their junction a depth of 4½ fathoms may be carried into the main (Astoria) channel of the river.

The outer bar gives least channel depths of 4½ fathoms at a distance of four and one-half miles from the line connecting Cape Disappointment with Point Adams. Beyond that distance the water rapidly deepens.

The southern (Clatsop) channel was then the more direct way into the river; depths of 27 feet could be carried through it; the distance from the bar to that part of Clatsop channel north of Point Adams measured about 7 miles.

This map shows no entrance to the direct channel from the southward, the hydrography not having been carried below the northern 4-fathom curve of Clatsop Spit. To what plane the surroundings were reduced in this survey the chart makes no note, but as high and low water lines are given and the soundings diminish toward the latter to zero, it is judged that low water was the adopted plane. That a series of tidal observations were made is shown by the fact that the symbol for the establishment of the port is given upon the chart, which value (XII½) does not vary more than a few minutes from the latest determinations of the Coast Survey.

This map, "M. C. R. 5 U. S. Engineer Office, Portland," was reduced from a scale of 3 inches to a nautical mile to a scale
124 of 1/40000 and traced for ready comparisons with previous and subsequent surveys.

1851. United States Coast Survey chart.—This chart was published in 1851. The following extracts are made from the Coast Pilot:

The first examination of the Columbia River entrance by the United States Coast Survey was made in 1850. This survey shows the following changes since 1841:

The South Sands (now called Clatsop Spit), which in 1841 stretched 6 miles to the westward from Point Adams, had been cut through about midway between the point and their western extremity by a wide channel with deep water running south by west from Sand Island; but the bar of this channel was not fairly opened, there being less than 3 fathoms on it. This channel was, therefore, running at right angles to that of 1841 and over the spot marked bare in 1839 (*v.* G. F. P.).

The north channel retained the same general features, but had moved to the southward, its southern part cutting away over a mile of the west end of the South Sands of 1841. It still had over a fathom more water than the south channel. Inside of Cape Disappointment it retained the same general direction as in 1841, but was more contracted.

The Middle Bank (Middle Sands) was much changed, but its northern part was similar to that of previous surveys. The eastern point had moved north-north-west three-fourths of a mile since 1841. Sand Island had much increased in size and had apparently moved with it. A long sand bank had made out from Point Adams in a northwest direction for over a mile. It was then, and is now, called Clatsop Spit.

The western end of the great middle shoal eastward of Point Adams had been cut away three-fourths of a mile.

The bar is shown upon this chart in the north channel half-way up its length to Cape Disappointment, and 1 mile westward of the line connecting Cape Disappointment and Point Adams, with a best depth of 27 feet.

After crossing the bar the north channel is open, with good depths of water, to and around the northern angle of the Middle Sands. The least water found in this passage is along the northeastern side of the Sands, where depths of 21 and 22 feet are given.

The soundings are reduced to the plane of mean low water.

1854. United States Coast Survey chart.—This chart was published in 1854 with the hydrography of 1852. Two distinct and separate entrances are shown to exist—one from the westward, 3 miles south of Cape Disappointment, and the other from the southward, 3½ miles southwest of Point Adams, caused by the Middle Sands, which extend from north to south across the mouth of the river.

The outer bar is shown at the entrance of the north channel 3 statute miles from the line connecting Cape Disappointment with Point Adams. Twenty-seven feet may be carried through the channel, with good depths of water, to Bakers Bay anchorage. The channel northeast of the Middle Sands from the bay to the river carries 21 feet. The better entrance into the river is now through

the south channel, where, after crossing a narrow bar with 21 feet of water upon it, a channel nearly 1 mile wide, with good depths, is open. From the entrance the channel runs 3 miles to northward, and thence eastward to deep water of the river.

The soundings are reduced to the mean lower low water.

This chart "M. C. R. 7, U. S. Engineer Office, Portland," scale 1/40000, was traced for a ready comparison with other surveys.

1868. United States Coast Survey chart.—This chart was published in 1874, with the hydrography of 1868, and shows a north channel between Peacock Spit and the Middle Sands. The entrance of it is 3 miles southwest of Cape Disappointment, where a depth of 21 feet may be carried over the bar into Bakers Bay. At the junction of this channel with the main one of the river 21 feet exist (Chinook channel).

The south channel opens from the southward with an entrance 2 miles wide, its central line lying 4 miles west of Point Adams.

Depths not greater than 25 feet may be carried into the
126 deeper water of the river.

Soundings are reduced to the mean lower low water.

1876. United States Engineer survey. Assistant Engineer Jessen.—Twenty-two feet may be carried over the outer bar of the north channel, 3 miles west of line from Cape Disappointment to Point Adams, with good depths to Bakers Bay.

The Chinook Spit channel bar shows best depths of from 13 to 19 feet.

The south channel has least depths of 2.0 feet at its entrance.

The soundings are reduced to the mean lower low water.

1878. United States Engineer Survey, Lieutenant Payson.—The outer bar near the entrance of the north channel, distant 3 miles from the line of Cape Disappointment and Point Adams, shows greatest depths of 23 feet, which may be carried over it to deeper water of Bakers Bay. The bar in Chinook Spit channel has depths from 15 to 17 feet. The entrance to the river is by the south channel, which shows at its mouth a narrow opening of 20 feet depth.

The soundings are reduced to the mean lower low water.

1879. United States Engineer Survey, Assistant Engineer Jessen.—The outer bar at the entrance to the north channel is distant from the reference line heretofore taken 5 miles. Twenty-three feet can be carried over this bar into Bakers Bay.

Chinook Spit channel is still shoaling. It was scraped during the year, but without any decided gain of depth. Its bar shows channel depths from 14 to 15 feet.

The entrance to the main river channel is by the south channel, 3½ miles due west of Point Adams. Depths of 20 feet only can be carried through this channel.

The soundings are reduced to the mean lower low water.

1880. United States Engineer Survey, Assistant Engineer Jessen.—The outer bar at the entrance of the north channel is
127 distant from the reference line 2½ miles. Depths of 21 feet may be carried over it into Bakers Bay.

The bar in Chinook Spit channel extends along the entire eastern border of Sand Island. The channel depths upon it vary from 14 to 15 feet.

The Middle Sands hinged to Sand Island show a gradual deepening at a point 1¼ miles due south from Cape Disappointment, where a bar less than one-fourth of a mile in width may be crossed with from 17 to 18 feet of water upon it. The surveys of 1878 and 1879 show this severance between Sand Island and the Middle Sands to have been gradually increasing.

The former survey shows this bar to have been a little over and the latter a little less than one-half mile in width. The narrow ridge was scraped this year with favorable result. This connection between the main channels is called the cut-off.

Nineteen feet is the best water over the bar of the south channel.

The soundings are reduced to the mean lower low water.

This chart "M. C. R. 16, Engineer Office, Portland," was traced for a ready comparison with other surveys.

1881, United States Engineer Survey, Lieutenant Price.—The outer bar near the entrance to the north channel is distant 2 miles from the reference line.

Twenty feet of water is stated in the report of the survey to be the best depth which can be carried over the bar to Bakers Bay.

The severance (cut-off) between the Middle Sands and Sand Island has now the shape of a short narrow channel, 20 feet in depth, connecting the north and south channels.

The bar in Chinook Spit channel has been filled to depths from 12 to 13 feet.

The entrance to the south channel has been gradually shoaling with formation of lumps. The depths found here are from 17 to 19 feet.

128 The passage to the river is now made by crossing the bar of the north channel, thence by this channel 2½ miles in a southeasterly direction to the cut-off, crossing at that point to the south channel and the deeper water of the river.

Soundings are reduced to the plane of lower low waters.

1882, United States Engineer examination, Lieutenant Price.—Best depths on outer bar near mouth of north channel are 19 feet.

The cut-off shows depths of 22 feet, with a good channel of 21 feet.

The south channel has been virtually closed to deep-draft vessels by many lumpy formations at its entrance. Depths varying from 15 to 17 feet only are found here. The soundings were reduced to the plane of the lower low waters.

The minor channel across the Middle Sands, about halfway between the north and south channels, whose formation was first noticed in 1879, has now a depth of 17 feet on a straight line. An unsuccessful attempt was made to deepen this new channel by stirring up the bottom with large harrows.

1883, United States Engineer survey, Assistant Engineer Von Geldern.—This survey included a development of Clatsop and Peacock spits, and soundings in Bakers Bay.

The north channel had become narrower since 1881 and had shoaled to 18 feet on the sea bar. It had also moved three-fourths mile to the north into an almost northwesterly direction.

The south channel had become the ship channel and had worked three-fourths mile nearer Clatsop Spit to an almost due south direction. There had been a general increase in depth to 20 or 21 feet, with lumps having a depth of 18 or 19 feet.

Tillamook Chute, the swash channel across Clapsop spit, whose existence was known in 1881 but not shown on chart of that year, had increased in importance and moved to the north. It carried 12 feet nearly across the spit.

129 The Fort Stevens bar had about the same depth on it as in 1881, 20 feet.

Sand Island had been pushed farther north into Bakers Bay by the main channel and the inside channel into Bakers Bay had shoaled.

The cut-off channel into Bakers Bay west of Sand Island showed tendencies toward shoaling. Peacock Spit was shoaling at its inner end and extending toward Sand Island.

1885. United States Engineer survey, Lieutenant Burr.—A complete survey of the channels, spits, and Bakers Bay from Fort Stevens to the sea.

The south channel was the only one used by deep-draft ships. Its depth, 20 feet, and location were essentially the same as in 1883, the movement toward Clatsop spit having been only one-fourth mile. There were fewer lumps in the channel.

The north channel had shoaled to 17 feet and moved farther north, close to Cape Disappointment. It had practically disappeared, being used only by light-draft vessels from the north.

The Fort Stevens bar had shoaled to 19 feet.

Tillamook Chute had moved northwest, 1,500 feet, and while it had not increased in area it had increased in depth. Clatsop spit had gained in depth outside the 6-foot contour and had extended in all directions, most markedly toward the west.

The northward movement of the main channel continued and Sand Island moved correspondingly into Bakers Bay. Bakers Bay had not shoaled materially. The inside channel east of Sand Island had shoaled to 8 feet from the 16-foot depth of 1881, and the cut-off channel to 14 feet from 26 feet in 1881.

Peacock Spit had shoaled in all directions joining on to Sand Island on the east and the Middle Sands on the west. A breach had been made through Sand Island at the elbow.

The depth on the Middle Sands had increased generally, and on the southwest quadrant of the bar the sea slope had moved seaward noticeably.

130 Preliminary steps were taken for beginning the construction of the jetty across Clatsop Spit.

1886. United States Engineer examination.—A survey of the ship channel and Clatsop Spit.

The south channel had continued to lengthen by shifting toward

the southeast, its depth and width remaining about the same as in 1885.

Tillamook Chute had not deepened but the river end had widened and moved toward the end of the spit.

Work upon the shore end of the jetty was under way.

1887 and 1888.—No surveys or examinations were made in 1887 and 1888, but it was known from pilots and others that the north channel had disappeared and that the south channel had practically the same depth and location as in 1886. Peacock Spit had joined completely to the Middle Sands, over which the depth was about the same as in 1885.

The construction of the jetty had extended to a length of about one-half mile by August, 1886, but had not shown any effect upon the channels.

1889. United States Engineer survey, Assistant Engineer Clapp, in September and October.—A complete survey of the channels, spits, and Bakers Bay from Fort Stevens to the sea, made near the end of the working season.

At the time the survey was made the jetty had reached a length of about 2½ miles, nearly all of which had been raised to or near low-water level.

Earlier in the season the channel was reported as having a tendency toward a straight course out to sea, and marked changes were evident in Clatsop Spit, which showed much more area bare at low water.

At the time the 1889 survey was made the condition of the channels and spits was as follows:

131 The entire southwest quadrant of the bar had deepened to 20 and 22 feet, with many lumps of 19 feet, but only a few less than 19 feet. Several 20 to 21 foot channels existed, the buoyed channel running out southwest to the sea about 2 miles northwest of the 1885 channel. The Middle Sands had thus practically disappeared.

The sea slope of the bar moved seaward along its westward face. From the 1889 channel line south along the face of Clatsop spit there was a marked recession of the sea slope, and in the northwest section there was a similar recession of less extent.

Peacock Spit showed a remarkable development, having shoaled to depths of about 5 feet for a distance of nearly 2½ miles from Cape Disappointment. At this time it had in this direction its greatest known development in height.

The east and west channels into Bakers Bay had shoaled to 5 feet and 10 feet, respectively, and were never afterwards used by any but light-draft vessels.

The northward movement of the main channel had continued, carrying Sand Island farther into Bakers Bay.

Marked changes had taken place about Clatsop Spit. The Fort Stevens bar had deepened to 24 feet from 19 in 1885. Clatsop Spit had shoaled materially and extended, particularly at its northwest corner. Tillamock chute had almost disappeare-.

1890. United States engineer examination.—An examination of the channel across the outer bar.

The channel over the outer bar had deepened to 24 feet, but had not shifted in position. The distance between the inner and outer 30-foot contours had been reduced from 1⅝ miles in 1885 to 1 mile.

The jetty had been extended to a length of 3¼ miles, of which 3 miles had an average height of low water. Large accretions of sand had been made in the vicinity of the jetty, and large areas
132 were bare at extreme low water.

1891. United States engineer examination, Assistant Engineer Hegardt.—An examination of the channel from the end of the jetty to the sea.

The jetty had been raised to low water for a length of 4 miles. The accumulation of sand in the vicinity of the jetty had continued, particularly on its sea side, and large areas were 2 and 3 feet above low water.

The channel across the outer bar had deepened to 27 feet for a width of one-half mile and had moved to the north 2,000 feet from the 1890 location, but the bar-crossing was still pointed to the southwest. The 30-foot contours were one-half mile apart where they approached each other nearest.

1892. United States engineer examination, Assistant Engineer Hegardt.—An examination of the channels and spits from the end of the jetty to the sea.

The jetty had been extended to its full length, 4¼ miles. All of it had been raised to low water, much of it to mid tide, and the shore end to high tide for a length of 1 mile. The accumulation of sand in the jetty area had continued, and the main position of it on the sea side had an elevation of 3 or 4 feet above low water.

The channel over the bar was 27 feet deep for a width of 1 mile, with a central depth of 28 feet of insufficient width. It had moved north one-third mile since 1891 (three-fourths mile since 1890), but still pointed southwest on the bar crossing. The 30-foot contours had approached to within one-fourth mile of each other on the line of the 1891 channel.

The crest of the bar had shoaled for the 2 miles southwest of the end of the jetty, and had deepened markedly over the entire westerly extension of Peacock Spit, that had been so shoal in
133 1889. In the entire northwest quadrant of the bar the sea slope had advanced materially, and in the southwest quadrant there had been a similar recession of the sea slope since 1889.

1893. United States engineer survey, Assistant Engineer Hegardt.—A complete survey of the channels, spits and Bakers Bay from Fort Stevens to the sea.

The jetty had been raised to high tide for 2 miles of the shore end, and the remainder was about 3 feet above low water. The accumulation of sand in the jetty area had continued, and reached a height of 5½ feet above low water over a large area. It was therefore beginning to drift across the jetty in places.

The channel had shifted slightly to the north to a distance of five-sixth of a mile from the 1890 position, but still pointed southwest

on the bar crossing. The 27-foot channel was three-fourths of a mile wide, and there was a 29 foot channel of available width. The 30-foot contours had come together at one point, but a 30-foot channel depth was not available, and they were generally three-fourths of a mile apart.

The Fort Stevens bar had deepened to 29 feet.

Peacock Spit continued to deepen west of Cape Disappointment. The channel west of Sand Island into Bakers Bay remained of the same depth, 8 to 10 feet, and east of the island had a depth of but 4 feet.

A Board of Engineers was convened to consider the completion of the work, and recommended the raising of the jetty to 12 feet above datum (mean lower low water) at the shore, sloping thence to 10 feet at ⅛ miles and to 4 feet at the outer end. No extension was recommended.

134 *1894. United States engineer examination, Assistant Engineer Hegardt.*—An examination of the bar channel.

The jetty had been raised to 10 feet above low water at the shore end, sloping to 7.5 above low water at 2½ miles and to mid tide from that point to the end. Work had been suspended for lack of funds.

The shoaling of the bar southwest of the jetty end had continued with a northerly movement, and had grown to be a distinct shoal extending west and northwest.

The channel had shifted slightly to the north and was nine-tenths of a mile from the 1890 position, but still pointed southwest on the bar crossing. Its depth remained the same as in 1893, 29 feet, but its width was greater. The 27-foot channel was 1 1/5 miles wide and the distance between the 30-foot contours was the same as in 1893.

The Fort Stevens bar had deepened to 30 feet, an increase of 11 feet since 1885.

The channel west of Sand Island into Bakers Bay had continued to shoal and become narrower.

1895. United States engineer survey, Assistant Engineer Hegardt.—A complete survey of channels, spits, and Bakers Bay from Astoria to the sea.

The jetty had been practically completed in accordance with the original and revised projects, which projects provided for a height of 12 feet above lower low water at the shore end, sloping to 10 feet in a distance of 1.8 miles, and thence to 4 feet at the outer end.

The accumulation of sand in the jetty area had continued on the sea side of the jetty; the spits had not materially increased in area, but had increased in elevation, and large areas were bare at mean high tide. The northerly movement of sand across the jetty continued. The spits had almost become an extension of the

135 Point Adams beach, being separated from it by only a narrow channel.

The channel over the outer bar had moved north two-fifths mile since 1894, 1¼ miles since 1890, and 3¼ miles since 1885, and still continued to point to the southwest, although the channel west of Sand Island ran out almost due west to the sea. The bar

channel had a depth of 30 feet for a width of seven-eighths mile and 31 feet for a width of one-half mile the maximum bar depth so far as known.

The Fort Stevens bar had a depth of 32 feet.

The shoal extending west from the end of the jetty had extended and lost depth. It formed the southwest quadrant of the bar and its crest was shoaler than at any time since 1881 prior to 1902. The northwest sector of the bar and the spits extending seaward from Peacock Spit had increased in depth since 1889 and 1892. Peacock Spit itself had largely decreased in area, the 12-foot contour being about parallel to the coast line of Cape Disappointment and but little more than one-half mile from it. South and inside of the cape Peacock Spit had shoaled, parts if it being bare at and above low water, and the channel between it and Sand Island had narrowed, but retained the same depth.

The northerly movement of the main channel at Sand Island had ceased. The wearing of the north bank continued at a much reduced rate, but the cutting back of the south bank shifted the mid-section line southward.

The sea slope of the bar south of the channel had receded, as had also the sea slope of Clatsop Spit beach to a less extent. North of the channel the sea slope of the bar had advanced markedly since 1889 and 1892.

1336 *1896. United States engineer survey, Assistant Engineer Hegardt.*—A complete survey of the channels, spits, and Bakers' Bay from Astoria to the sea.

The condition of the jetty remained as in 1895, with the exception that the level of the extreme outer end had been reduced to low water by the leveling action of the sea. The accumulation of sand in the jetty area had continued, and this survey shows for the first time the high-water line of Clatsop Spit extending north across the jetty, with a hook trailing upstream. The small channel between the spit and Point Adams had narrowed and shoaled.

The bar channel had moved materially to the north, the movement amounting to seven-eights mile since 1895, 2⅛ miles since 1890, and 4⅜ miles since 1885. Over the bar it still pointed to the south of west, although nearer west than in previous years. The general direction of the channel from the gorge to the sea was north of west. On the bar it had shoaled materially, being but 30 feet deep for a narrow channel and 29 feet for a width of seven-eighths mile.

The Fort Stevens bar had about the same depth as in 1895, 31 or 32 feet.

The southwest section of the bar (the shoal extending westerly from the end of the jetty) retained about the same position as in 1895, but showed a distainct scour and deeper water across it. The 30-foot contour on that side of the channel also moved south.

A noticeable change was evident in Peacock Spit, which had receded inshore materially. The 12-foot contour was nearer the coast, and the area bars at low water and almost entirely within the cape,

trailing to the southeast and nearer to Sand Island. A
137 swash channel across the spit was shown, and the channel into Bakers Bay had shoaled to 3 feet and become much more narrow.

1897. United States engineer examination, Assistant Engineer Hegardt.—A survey of the bar and channel from the end of the jetty to the sea.

The jetty and Clatsop Spit remained in about the same condition as in 1896.

The bar channel retained the same position and depth, but the 30-foot channel was 2,000 feet wide. The 27-foot channel was seven-eighths mile wide.

On the southeast section of the bar there was a continuation of the deepening noted on the previous survey across the shoal extending northwesterly from Clatsop Spit and the contours on that side of the channel had moved to the south. To the southwestward of the jetty the shoaling appeared to have been considerable, but no soundings were available for exact information.

The movement of Peacock Spit toward the east and of Sand Island continued, with an increase of the swash channel previously noted and a decrease of the old Cut-off channel.

1898. United States engineer examination, Assistant engineer Hegardt.—A survey of the bar and channel from the jetty end to the sea.

No material change was apparant in the jetty and Clatsop Spit.

A noticeable change had occurred in the bar crossing. The channel over the outer bar, which had pointed persistently to the southwest or south of west, had shifted at its outer end 1 mile to the north since the previous survey and for the first time since the disappearance of the old north channel now pointed northwest, a swing of about 55°, the inner end of the channel remaining in about
138 the same location as in 1897.

The bar channel had also lost 1 foot in depth and was but 29 feet for a width of 2,000 feet, with a distance of three-fourths of a mile between the inner and outer 30-foot contours; the 27-foot channel was seven-eighths of a mile wide.

The southwest section of the bar continued to deepen. The 24-foot contour had advanced northwest 1¼ miles toward the channel, but the 18-foot contour had receded southeast 1½ miles, and the 12-foot contour was south of and almost opposite the jetty end. The inside channel contours had also moved south.

At Peacock Spit the receding of the outer contours and the movement of the bare part of the spit toward Sand Island had continued. The latter was almost connected with Sand Island at low water and the old Cut-off channel had disappeared, while the new swash channel had increased and become the only open water between Sand Island and Cape Disappointment.

1899. United States engineer survey, Lieutenant Fries.—A complete survey of the bar spits and channel from Fort Stevens to the sea.

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The jetty remained as in previous years. A project for a 40-foot channel was inaugurated.

Clatsop Spit had continued to grow in elevation and to extend in the direction of its length. The low-water line had connected with Point Adams, obliterating the remains of the old swash channel, and had also extended toward the jetty end.

The channel over the outer bar remained in the same position as in 1898, pointing northwest. It had continued to shoal, having a depth of but 28 feet for a width of five-eighths of a mile and 27 feet for a width of seven-eighths of a mile. The 30-foot contours were from 1¼ to 1½ miles apart. The Fort Stevens bar had deepened to 33 feet.

The southwest section of the bar continued to deepen and
139 the contours on its channel side to move south. The end of the 24-foot contour receded slightly from the bar channel and the 18-foot contour advanced. There appeared to be indications of Clatsop spit working out to the end of the jetty, shoaling being apparent on both sides nearly to the end.

The sea slope of Clatsop Spit continued to deepen and receded outside the 18-foot contour, but the 18-foot contour and the high and low water lines remained as in 1895. In the southwest section of the bar there was no marked change in the sea slope, although the crest of the bar had been lowered, a slight advance being shown at some points and a recession at others. The same conditions existed in the northwest sector, although the channel swung across it between 1895 and 1899.

The change in Peacock Spit had continued. The outside contours had receded until the 18-foot contour was but three-eighths of a mile from the shore line and the 24-foot contour was distant about 1 mile. The bare portion of the spit, now known as Republic Spit, had become attached to Sand Island, and other bare areas had risen between it and the cape. The channel face of the spit had been pushed south, the 30-foot contour having shifted 1,000 feet since 1895.

In the main channel at Sand Island the north bank had shifted north 500 feet since 1895. With the northerly movement of the south bank, which had receded between 1889 and 1895, there had also been a northerly movement of the midsection line which in this year (1899) occupied about the same position as in 1885.

Congress authorized the preparation of a project for an increase in the depth of the bar channel to 40 feet, and a report thereon was submitted by the district engineer recommending a 3-mile extension of the jetty.

1900. United States engineer examination, Assistant Engineer Hegardt.—A survey of the bar and channel from the jetty
140 and to the sea.

No change is shown in the jetty or in Clatsop Spit of importance.

The channel across the outer bar had moved north two-fifths of a mile, pointing toward the northwest, and had shoaled four or five

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feet. There was only a narrow channel 24 feet deep and a 23-foot channel 1 mile wide. The distance between the 30-foot contours was 2¼ miles and was greater than on the south west section of the bar, where it averaged about 1⅝ miles.

From For the first time since 1890 the 24-foot contours were continuous from Clatsop Spit to Peacock Spit. There was a material shoaling of the northwest and west sections of the bar, although the 12 and 18 foot contours retained about the same position west of Cape Disappointment. In the southwest section there had been a deepening for 2 miles west of Clatsop Spit, and from there on northwest a shoaling, the 18-foot curve having advanced 1 mile

In the channel west of the jetty end the contours on the south side had suspended their previous movement to the south. On the north side the 30 foot contour remained about the same but the 18 and 24 foot contours had worked south and more noticeably west, indicating a tendency of Peacock Spit to build up again toward the west.

1901. United States engineer examination, Assistant Engineer Hegardt.—A survey of the bar and channel from the jetty end to the sea.

No change of importance is shown in the jetty or in Clatsop Spit, excepting a continuance of the shoaling on both sides of the jetty near its end.

The bar channel had shifted one-eighth of a mile farther to the north and shoaled to 23 feet, with a width of 1,000 feet. The distance between the 30-foot contours at the channel remained
141 2¼ miles, while on the southwest sector of the bar it had narrowed to 1½ miles. The 24-foot contours were half a mile apart.

On the southwest sector of the bar there had been no radical change since 1899, excepting a deepening just west of the end of the jetty. In the remainder of this section there had been a slight deepening in some places and shoaling in others.

In the western sector of the bar, just north of an east and west line through the gorge, there had been a deepening where a shoaling was shown by the previous survey.

The sea slope of Clatsop Spit continued to deepen and the low-water line receded slightly, but the 18-foot contour and the high-water line retained the same positions as in 1895 and 1899, respectively. There was no remarkable change in the sea slope of the bar itself, although there was a general tendency to recede, most marked near the location of the 1896 channel.

There was no important change in Peacock Spit west of Cape Disappointment. South of the cape the spit continued to build up and toward the sea, particularly at the southwest corner, from which a point of the 18-foot contour extended due west to the channel. Excepting the tendency of Peacock Spit to crowd south into the channel, there was no material change at or west of the gorge.

An appropriation was made and preparations commenced for carrying out the project recommended in 1899 for a 40-foot channel.

1902. United States Engineer Survey, Assistant Engineer Hegardt.—A complete survey of the bars, spits, and channel from Fort Stevens to the sea. No survey of Bakers Bay has been made since 1896.

The jetty remained in about the same condition as in previous years. Preparations were continued for resuming work on
142 the improvement under the project prepared in 1899 for a 40-foot channel. An appropriation was made for that purpose and a Board of Engineers appointed.

The old channel had straightened out and swung toward Cape Disappointment, pointing almost north. Its sea end was nearly 6½ miles from the 1885 location and over 4 miles from the 1890 channel. It had a depth of but 22 feet for width of about 1,000 feet.

The distance between the 30-foot contours at this channel was 2¼ miles, while it was 1⅜ miles in the southwest sector of the bar.

With the general deepening of the bar crest two other channels of importance about equal to the remains of the old channel were developed. Of these two channels the first was near the 1895 channel and had a depth of 22 feet. Later reports in the fall of 1902 indicated this channel to be improving in depth. The second channel was near the 1889-90 channels and had a depth of 21 feet.

The Fort Stevens bar had a depth of 34 feet.

There had been a general lowering of the crest of the bar from the jetty to the 1895 channel location. This scour had been most pronounced about 1 mile from the end of the jetty and for 3 miles of this section the conditions were quite similar to those existing in 1885. Between the 1895 and 1901 channel locations there were only slight changes, but between the 1901 channel and Cape Disappointment there had been a considerable fill, averaging 6 or 8 feet on the crest of the bar.

The sea slope of Clatsop Spit from the end of the jetty southward had continued to deepen irregularly beyond the 18-foot depth. The 18-foot contour remained practically the same as in 1895 and 1901, the low-water line remained as in 1901 excepting near the end
143 of the jetty, where it had cut back, and the high-water line remained as in 1901 excepting that it had connected with the Point Adams shore, becoming continuous with it; the Clatsop beach above high water had widened.

The sea slope of the entire bar showed a general tendency to scour, and this tendency was most positive in the southerly sector, notwithstanding the lowering of the crest of the bar.

No material change occurred in Peacock Spit west of the cape, but the most southern part of the spit continued to build up and extend to the west, the channel face cutting back slightly. Sand Island and Republic Spit continued to grow toward the west.

No change occurred in the main channel at the gorge, the conditions at the point being practically identical with those existing in 1899 and 1901 with the exception of a deepening, most pronounced opposite the end of the jetty.

144 G. B. HEGARDT, being duly sworn as a witness on behalf of the Complainant, testified as follows:

Direct examination.

By Mr. MACDONALD:

Q. Mr. Hegardt, will you state your name, residence and occupation.

A. My name is G. B. Hegardt; my age is 47; I live in Portland, Oregon; my occupation is civil engineering.

Q. How long have you been engaged in the profession of civil engineering?

A. About 25 or 26 years.

Q. State the name of the school or college of which you are a graduate.

A. I graduated at the School of Technology in Sweden.

Q. In what year?

A. 1878 or 1879.

Q. State what experience you have had since you graduated.

A. I have been engaged on railroad work, and principally with the United States Government in river, harbor and fortification work.

Q. In what year were you first engaged by the United States government in river and harbor work?

A. In 1880.

Q. Where?

A. In Chicago, Illinois.

Q. How long were you there?

A. I was in that office until 1887.

Q. From thence where did you go?

A. I then came out to Oregon.

Q. Were you engaged in government work in Oregon?

A. Yes.

145 Q. When and where?

A. First at Cascade Locks; I was there about three or four months, and then came down to the mouth of the Columbia River.

Q. How long were you engaged in the Government service at the mouth of the Columbia River?

A. From 1888 until a year ago last June.

Q. What was the character of your work while you were engaged in the government service at the mouth of the Columbia River?

A. The construction of a jetty was the principal work.

Q. State whether or not in the prosecution of your work you took charge of the survey of the mouth of the Columbia River, the bar, entrance, etc.

A. Yes; all the surveys made since I came there were made by me personally or under my direction.

Q. What years did these surveys cover?

A. The first one was made in 1889.

Q. I will inquire of you, Mr. Hegardt, if you are the same Mr. Hegardt who made the surveys mentioned and described in Major

Langfitt's report, which is contained in Washington's Exhibit G in this case, for the years 1891 and following?

A. Yes, I am the same person.

Q. Did you make any surveys previous to 1891?

A. In 1889 was the first one. It was made under my direction. I did not make it personally, although I was out often with them.

Q. And all the subsequent surveys from 1889 were either made by you personally, or under your direction, I understand.

A. Yes sir.

Q. I desire to call your attention to sheet No. 6140, entitled Columbia River Sheet No. 1, Entrance to Upper Astoria, Published in Washington, D. C., March 1905, by the Coast and Geodetic Survey.

146 This map is before me and is duly authenticated by the Assistant in charge of office of Coast and Geodetic Survey and by the Assistant Secretary of Commerce and Labor, under the seal of the Department of Commerce and Labor. I ask you if these lines in black, red, green and blue and the other colorings which appear on that were made by you or under your direction?

A. They were made under my direction.

Q. I wish you would state fully and in detail just what changes or additions have been made to that map which were not shown upon — as it came from the office of the Coast and Geodetic Survey?

A. Directly at the mouth of the Columbia River you see the lines shown in red; they were taken from the Coast and Geodetic Survey of 1854; they were traced from that map and then transferred directly onto this map that you just spoke of, and the coloring put in between 18 foot contours.

Q. I understand all the red coloring in there is from the hydrography of 1854?

A. From the hydrography of 1854.

Q. Now I wish you would describe what this black line marked "1905 channel" designates.

A. That is the line usually followed by all deep sea-going vessels, inbound and outbound.

Q. Then, I understand, that indicates the ship channel of 1905?

A. The ship channel of 1905, yes sir.

Q. Of vessels coming from the ocean going to what points?

A. To Astoria and continuing on up the river.

Q. I wish you would tell us what the upper blue line upon this map indicates.

A. That represents the boundary line as claimed by the state of Oregon and taken from that lithograph map.

147 Q. That is simply a reproduction of the line as shown upon the map attached to the answer of the State of Oregon?

A. Yes, that is the identical line.

Q. Are there any other additions or changes upon that map which you have not yet described?

A. The survey of 1854 did not continue farther inland than to Fort Stevens; and in order to complete the records as far as possible before the admission of the State of Oregon into the Union the survey of 1851 was produced and marked on that map in Green.

Q. Does the survey of 1851 extend up the river approximately from a line drawn from Chinook Point to Point Adams or Fort Stevens?

A. It extends up the river to point Adams or Fort Stevens, and then up to complete the whole of that first sheet.

Q. Then, I understand, the hydrography of 1854 is west and seaward from the same line drawn from Chinook Point to Fort Stevens?

A. That is correct.

Q. Are there any other changes upon that map?

A. Directly at the mouth of the river there are two 18-foot curves shown in blue, with soundings between them, indicating a channel which is shown on the map of 1839.

Q. I observe upon that map some range lines, for instance, from Point Adams up towards Point Ellice and a line from Point Adams to Coxcomb Hill; a line from Cape Disappointment to Snag or Green Point, and another range line from Cape Disappointment or Cape Bluff to Leading-in Cliff, and perhaps some other range lines in red. I wish you would tell us upon what authority or from what data you base those range lines.

148 A. They were taken directly from the map of the survey of 1854.

Q. Made by whom and under what authority?

A. By the United States Coast and Geodetic Survey and are covered by the sailing directions shown in red on the left on the same map.

Q. These printed sailing directions which appear on the extreme left of the map are also taken from the public publications?

A. They were taken from the same map of 1854.

Q. I notice you have written or printed in red ink the names of various capes, such as Leading-in Cliff, Snag or Green Point, Clatsop Spit, etc. From what authority did you obtain that information?

A. They were also taken from the map of 1854 as called for in the sailing directions to which these ranges were referred.

Q. Then, I understand that all of the information which you have platted upon this map has been taken from official government publications?

A. Yes sir.

Q. If I have omitted to call your attention to any changes or additions upon that map I should be glad to have you give them now.

A. There are some general notes there explaining the different colors, right underneath the sailing directions.

Q. That covers everything?

A. That covers everything now.

Mr. MACDONALD: The state of Washington desires to offer in evidence this map No. 6140, which has been identified by the witness, being the sheet concerning which the witness has just testified.

The same was marked Washington's Exhibit H and signed by the Commissioners.

149 Attorney General CRAWFORD: The state of Oregon has no objection to this map.

Q. I desire to direct your attention to chart No. 6141, entitled Columbia River sheet No. 2, issued May, 1890, by T. C. Mendenhall, Superintendent, from the United States Coast Survey, Treasurers Department, evidently from the United States Coast and Geodetic Survey, which is duly authenticated by the official in charge of the office of the Coast and Geodetic Survey and by the Assistant Secretary of Commerce and Labor under the seal of the Department of Commerce and Labor and ask you whether or not the changes which appear upon that map since it left the office of the Coast and Geodetic Survey were prepared or were made by you or under your directions?

A. Yes sir, they were made under my directions.

Q. I wish you would explain, first, what the most northerly line in blue designates?

A. That designates the boundary line as claimed by the state of Oregon.

Q. And I understand it is an exact reproduction of the line as shown in the answer of the state of Oregon on file in this case?

A. Yes sir.

Q. I wish you would explain what the black line marked 1905 channel indicates?

A. That shows the channel line as used at the present time.

Q. From what information or upon what data did you base that line?

A. I got the location of all the buoys and other aids in navigation at the lighthouse department in Portland.

Q. There is another line marked "1859 channel line" which passes through Woody Island and south of Snag Island and on that map. Please inform us what that line indicates.

150

A. That indicates the channel line of 1859 as it existed, so far as we know.

Q. And what does the line passing north of Snag Island through Cordell Channel indicate?

A. That indicates the Cordell Channel which was discovered in 1867 and 1868 when the survey was made.

Q. There appears to be another line on there from Tongue Point up to Harrington or Yellow Bluffs. I wish you would inform us what that line indicates and from what information you made it.

A. That is the present channel.

Q. There appears to be [illegible]r coloring, in yellow, upon that map. I wish you would acquaint [illegible]with what that indicates.

A. That indicates the soundings, channels, and shoals as taken from the survey of 1867 and 1868 from the government map.

Q. Do I understand that all of the information which you have platted upon that map has been derived by you from Government publications, maps and reports?

A. That was taken from a certified copy of the survey.

Q. Are there any other changes or additions to that map made by you or under your supervision which you have not yet explained?

A. The only remaining ones are the general notes explaining the different colors on that map.

Mr. MACDONALD: Complainant desires to offer in evidence the chart just referred to by the witness in his testimony.

The same was marked Washington's Exhibit I, and signed by the Commissioners.

Attorney General CRAWFORD: Let the record show that the State of Oregon has no objection.

151 Q. I hand you chart No. 2, from Washington's Exhibit C, being Admiral Vancouver's Survey of entrance to Columbia River, and I will first inquire what was the first official survey or map made of the Columbia River so far as you know.

A. This Vancouver Survey of 1792.

Q. I wish you would examine that map and tell us where the main ship channel of the Columbia River was at that time with reference to the 1905 ship channel as shown on Washington's Exhibit H.

A. The main ship channel in 1792 was slightly north of the present channel line, almost due north of it, probably about a quarter of a mile.

Q. About a quarter of a mile north of the present channel.

A. Yes.

Q. You may state whether or not Sand Island is shown upon the Vancouver map.

A. There is no evidence of Sand Island on the Vancouver map.

Q. What is the direction upon that map of the ship channel from the ocean to the upper river?

A. Coming across the bar it is practically due east and west.

Q. You are familiar with the location of Sand Island as it existed in 1839 are you not?

A. Yes sir, I am familiar with the maps and charts.

Q. Where would the ship channel on the Vancouver map pass with reference to Sand Island if it were then in the same position it was in 1839?

A. It would pass north of it.

Q. About how far north?

A. That is rather difficult to tell.

Q. Practically go right through it, would it not?

152 A. Practically go right through it, yes.

Q. How far up the river do the measurements show upon the Vancouver map?

A. On the north it shows practically up to Point Ellice and on the south it shows the point of Astoria.

Q. How far down does the 18-foot contour line extend from the north—Chinook Point?

A. It touches Chinook Point.

Q. It touches Chinook Point?

A. Yes.

Q. And from thence westerly, where does it run?

A. It practically runs in a straight line from Chinook Point to Cape Disappointment.

Q. What lines are shown along the southerly shore of the river?

A. I should think the line of Clatsop Spit.

Q. From your examination of that map or chart, you may state what direction ocean-going ships and craft would pursue in going up the river.

A. They would naturally go by the south channel.

Q. They would pursue the south channel, which, I understand passes close towards the Oregon side?

A. Passes close towards the Oregon side.

Q. Now, what is the next map published by the government in point of time after the Vancouver map?

A. In 1839.

Q. Is that Sir Edward Belcher's map?

A. Yes, that is Sir Edward Belcher's map.

Q. I will hand you the Sir Edward Belcher map, which is map No. 3, in Washington's Exhibit C, and I will ask you to describe

153 what ship channels are shown upon that map.

A. Two ship channels; that is, coming in at the mouth of the Columbia River; there is one north channel and one south channel.

Q. How close to Cape Disappointment does the north ship channel run?

A. It runs very close to it.

Q. How close?

A. I should think inside of a quarter of a mile.

Q. After that channel passes Cape Disappointment in coming in from the ocean, what course does it pursue in going up the river?

A. It takes a southeasterly course.

Q. How far (if any) north of Cape Disappointment does that north channel go?

A. The middle of that channel is just about due east of Cape Disappointment.

Q. You may state whether or not the north channel as shown by the Belcher map would pass north of Sand Island as it existed in 1839.

A. Yes sir.

Q. You may state whether or not it would pass north of Sand Island as it existed in 1905 or at the present time.

A. It would practically cut that Island in two.

Q. You mean that the channel would pass through about the middle of Sand Island as it exists at the present time?

A. Yes sir.

Q. Now, I wish you would describe the south channel.

A. The south channel enters from the ocean in a practically northerly course until it comes on a due west line from Point

154 Adams.

Q. Thence what course?

A. Thence due east to Point Adams.

Q. You may then state what course it follows in going up the river and how close it goes to the Oregon shore.

A. The survey does not extend beyond Fort Stevens.

Q. It only extends between——

A. On a line drawn between Chinook Point and Point Adams.

Q. You may state what the ruling depths as shown on that map are of the south channel.

A. Entering the south channel from sea the least depth there is 3¼ fathoms, and that depth is maintained and increased until it is between 8 and 9 fathoms in places.

Q. Then the ruling depth is 3¼ fathoms?

A. That is the least depth.

Q. What is the ruling depth of the north channel as of the date of that map?

A. The least depth appears to be 4¼ fathoms in entering the channel, and then the depth increases until it reaches 6 and 7, and as Cape Disappointment is approached the depth increases to 14 and 15 fathoms.

Q. Then, the north channel at that time would be regarded as the better one, would it not, for the navigation of ocean going steamers.

A. Yes sir, the north bar channel would be considered better.

Q. You may state whether or not there are any considerable sands between the north and the south channel at the entrance of the river.

A. There are several spits there at the entrance that divide those two channels, making the north and south channel.

155 Q. Is Peacock Spit shown upon that chart?

A. It is shown on there but it is not indicated by that name.

Q. How does the size of what appears there as Peacock Spit compare with Peacock Spit at the present time?

A. It extends about a mile and — half farther south than the present Peacock Spit.

Q. Then the Spit has since that time moved a mile and — half north?

A. A mile and a half north.

Q. How does Clatsop Spit compare, as shown upon that map, with Clatsop Spit of the pres-t day?

A. Clatsop Spit of the present-day is probably 2½ miles farther north than it was on the 1839 survey.

Q. You may state whether or not the sands as shown between the north and south channels of the Belcher map are in existance in the same place to-day.

A. No sir.

Q. Can you give the ruling depths at the present time of the channel over those sands as shown on Belcher's map?

A. Those are what they call the Middle Sands, dividing the two channels.

Q. Are the middle sands shown on Washington's Exhibit H here?

A. Not as it exists to-day.

Q. Those Middle Sands have entirely disappeared?

A. Have entirely disappeared.

Q. What is the next map in point of time after Sir Edward Belcher's map?

A. That is the Wilkes Map of 1841.

Q. I desire to hand you Oregon's Exhibit No. 2, being a
156 map of the United States Exploring Expedition, made by Charles Wilkes, and I will ask you to state what changes appear in the channels of the Columbia River since the Sir Edward Belcher map was made, concerning which you have just testified.

A. The position of Clatsop Spit is very much the same as before, and also of Peacock Spit, called North Breakers on this map.

Q. Are North Breakers and Peacock Spit one and the same?

A. They are the same now.

Q. Both names being used to designate the same spit?

A. The Middle Sands occupy about the same position as they did in 1839, but the two bar channels have formed in one.

Q. Where have they joined?

A. Right south of Peacock Spit.

Q. Is that junction of the channel about the same point where the south channel of 1839 existed, or is it north of that channel?

A. The channel is practically where the north channel of 1839 was.

Q. Practically where the north channel was?

A. Practically where the north channel was.

Q. Then, the south channel has disappeared?

A. According to this chart it has.

Q. And the two channels have united in the north channel of 1839?

A. That is the mouth, yes.

Q. I wish you would designate the course of the north channel as shown by the Wilkes map, with reference to its course past Cape Disappointment.

A. Coming in from the ocean we enter on a practically due east and west course until we come to a point directly south of
157 Cape Disappointment; thence in a practically due north course up to Cape Disappointment; thence rounding the Middle Sands and following it in a southeasterly direction and passing north of what appears to be Sand Island.

Q. Is Sand Island designated upon that map?

A. It is not so designated.

Q. Are you familiar with the location of Sand Island as it appears on the next map after this?

A. Yes sir.

Q. Then I will inquire of you whether this north channel passes north or south of where Sand Island would be if designated upon that map. I mean the old Sand Island as we have termed it.

A. That is 1851?

Q. Yes. Here it is right down here. (Pointing on map.)

A. The location of Sand Island would practically be the southeast point of the Middle Sands.

Q. Then, the north channel would pass to the north?

A. To the northward of Sand Island.

Q. You may state how the general course of the north channel up the river from Cape Disappointment on the Wilkes map compares with the same channel on the Belcher map of 1839.

A. It appears to be very much the same.

Q. You may state what the ruling depths of that channel are as shown upon the Wilkes map.

A. Entering from the sea the bar channel depth appears to be about 5 fathoms; and then the ruling depth from there up to Cape Disappointment is about 5 or 6 fathoms, increasing to about 12 fathoms directly opposite Cape Disappointment.

Q. And how about it from Cape Disappointment on to where Sand Island exists?

A. The least depth inside of that channel seems to be about 4 fathoms.

158 Q. Then, the ruling depth of that channel would be 4 fathoms?

A. About 4 fathoms, or 24 feet.

Q. I ask you what that line appearing on the map and running in an irregular direction following the north channel, indicates—from Cape Disappointment, evidently, to Chinook Point; is that a contour line?

A. That represents the 3-fathom of 18-foot contour line.

Q. That is the 18-foot contour line?

A. No, it is not; I will take that back. That represents 4 fathoms.

Q. That is the 24-foot contour line?

A. That is the 24-foot contour line.

Q. What are the depths within the 24-foot contour line in Baker's Bay?

A. Those depths vary from 4 fathoms to 8 and 9 fathoms.

Q. I desire to know particularly with reference to the immediate vicinity of Ilwaco.

A. That is within the 24-foot contour. The least depth we find there is 4 fathoms.

Q. Sand Island is not shown to be present in any portion of Baker's Bay on that map, is it?

A. There is nothing to indicate it except two spits marked "Bare."

Q. Is that Sulphur Spit?

A. No sir, that is on the southeast end of the Middle Sands.

Q. Then, there is nothing up in Baker's Bay proper to indicate the existence of Sand Island or any other sands?

A. No sir.

Q. Now, I wish you would take up the south channel as shown there and give me its direction from the ocean in going up the river.

A. Entering from the sea it is practically an east and west
159 course to and opposite Point Adams.

Q. How far up the river does that map give surveys or data? Up to Astoria?

A. Up to Astoria.

Q. Give me the ruling depth of the south channel from the sea to Astoria.

A. Entering from the sea the bar channel depths appear to be about 5 fathoms, and that is increased as we proceed in until we leave the north channel, when the depth decreases to 4½ fathoms at that

particular point; and then it increases to 6, 7, 8 and 9 fathoms until Point Adams is reached.

Q. How is it from Point Adams to Astoria?

A. Just after passing Point Adams I find depths here of 4 fathoms which are the least depths found in the channel from Point Adams up to and opposite Astoria.

Q. I understand you to say that the ruling depth of the channel was also 4 fathoms.

A. 4 fathoms yes.

Q. Then, the ruling depths would practically be the same upon those two channels?

A. Upon the two channels, the same.

Q. Have you any means of knowing which of those channels was used as the ship channel at that time?

A. No sir.

Q. So far as anything is shown by that map either channel could be used?

A. Yes; the south channel would be better in certain winds and the north channel better in the opposite winds. The south channel is the better course directly in from the sea.

Q. The south channel would be straighter and shorter?

160 A. It is straight.

Q. But which channel would be used would be largely determined by the direction of the prevailing winds?

A. Yes.

Q. What is the next map in point of time after Oregon's Exhibit No. 2?

A. 1851.

Q. I will ask you to examine Oregon's Exhibit No. 4, which is a survey of the mouth of the Columbia River published in 1851 and ask you to describe the channels from the ocean going up the river as shown upon that map.

A. There is one north channel and one south channel.

Q. How do those channels compare with reference to the position of the channels of the Wilkes map of 1841?

A. The south channel has broken through the spit and moved much farther south, and the middle sands have divided the channels absolutely; that is, at the entrance.

Q. Then, at the entrance, I take it, there are three channels?

A. No, in 1841 they were changed into one at the entrance.

Q. What does this map show now?

A. This shows two distinct channels.

Q. Did not the map of 1841 show two distinct channels?

A. They were joined at the entrance?

Q. Now there are two distinct channels at the entrance?

A. Yes, at the entrance.

Q. I wish you would take the southerly channel and describe its course with reference to the south channel of 1841 beyond the entrance.

A. The entrance of the south channel on this map is practically

two miles southeast of the entrance of the junction of the two channels in 1841.

161 Q. What are the ruling depths of that channel up as far as the map shows?

A. At the entrance of the south channel there appears to be a ruling depth of about 16 feet, and then the depth increases to 3¼, 4, 5, 6 and 7 fathoms until Sand Island, as marked on this map, is reached.

Q. Then what is the ruling depth up to Astoria?

A. Thence, commencing from Sand Island and going up towards Astoria the greatest depth is 10 fathoms, and the ruling depth is 4¼ fathoms, that is the least depth.

Q. What did you say the least depth was?

A. 4¼ fathoms.

Q. What are the ruling depths of the north channel?

A. At the entrance of the north channel the least depth appears to be 4¾ fathoms, and this depth increases to about 6⅞ fathoms as Cape Disappointment is approached; thence swinging around Sulphur Spit and continuing in a southeasterly direction we find the least depths to be about 3¾ fathoms until the east end of Sand Island is reached.

Q. Then, the ruling depth of the south channel is greater than that of the north channel?

A. Yes.

Q. And the south channel is shorter and more direct to Astoria and the upper river than the north channel?

A. Yes sir.

Q. I will ask you to state whether or not there are sailing directions given upon this chart?

A. Yes there are quite a number of sailing directions given both for the north channel and the south channel.

Q. I will ask you to examine those sailing directions and state whether or not any reference is made to the south channel being safe to beat in and out of the river?

162 A. Under the heading "Beating In" Under Sailing Directions for the South Channel up to Astoria, it says: "The south channel is a safe beating channel either in or out."

Q. You may examine the sailing directions of the north channel and state whether or not anything is said about the influence of tide and waves upon ships coming in through that channel with reference to difficulty in navigating.

Senator FULTON: I suggest that those statements will show for themselves.

Mr. MACDONALD: I want to get them into the record and save referring to the maps.

A. Under "Notes" it says: "The cross tides in the north channel and the baffling wind near Cape Bluff make this channel very difficult for sailing vessels."

Q. You may state whether or not there are complete sailing directions shown upon that map for both channels?

A. Yes sir.

Q. You may state whether or not Sand Island is shown upon that map.

A. Yes, Sand Island is shown on that map.

Q. And this is the first government publication that Sand Island, named as such, appears upon, as far as you are aware?

A. The first publication by the United States government.

Q. What is the relative position of Sand Island as shown upon this map, Oregon's Exhibit No. 4, with the Sand Island shown on Washington's Exhibit H, being the most modern map in evidence?

A. The relative position of the Sand Island of 1839—that was 1839, wasn't it?

Q. No, I asked you the relative position of Sand Island as shown on the map before you, Oregon's Exhibit No. 4, which I understand is dated 1851, and Washington's Exhibit H the most modern
163 map that we have in evidence.

A. The Sand Island of 1851 is about two miles or a mile and three quarters south of the present Sand Island.

Q. Do you mean south of the most southerly portion of the present Sand Island?

A. South of the most southerly part of it, yes.

Q. I will ask you to state whether or not vessels, in using the north channel as shown by the 1851 map, Oregon's Exhibit No. 4, passed to the south or the *the* north of Sand Island.

A. As it now exists?

Q. No, as on this map in front of you, Oregon's Exhibit No. 4.

A. They could pass both north and south of it.

Q. I mean in the use of the north channel.

A. Oh, in the north channel? They must go north of it.

Q. They go north of Sand Island if using the north channel, and of course they would go south of it in using the south channel?

A. Yes sir.

Q. I observe in some of these maps that Cape Disappointment is sometimes called Cape Hancock. These names relate to the same cape, do they not?

A. Yes, they are the same point identically.

Q. Now I will ask you to examine Oregon's Exhibit No. 5, being the U. S. Coast Survey of the entrance to the Columbia River, published in 1854, and ask you to state what channels from the ocean to the upper river are shown upon that map.

A. There also exist on this map one north and one south channel—bar channels.

Q. How does the north bar channel on this map, Oregon's Exhibit No. 5, compare with the north bar channel of Oregon's Exhibit No. 4?

A. They are practically the same as on the previous sur-
164 vey.

Q. And how does the remainder of the course of the north channel after you cross the bar, compare with the channel as shown on Oregon's Exhibit No. 4?

A. There is a shoaling in Baker's Bay; this map gives the least depth at 3½ fathoms.

Q. Is that in Baker's Bay or in the channel?

A. That is in Baker's Bay.

Q. A depth of 3½ fathoms in Baker's Bay?

A. The least depth, yes.

Q. What is the ruling depth of the north channel?

Q. That is the north channel.

Q. 3½ fathoms?

A. 3½ fathoms.

Q. Then that depth is less than the ruling depth as shown upon the map of 1851, Oregon's Exhibit No. 4?

A. Yes sir.

Q. You may state whether or not ocean going vessels in the use of the north bar channel would pass north or south of Sand Island as shown upon Oregon's Exhibit No. 5.

A. They pass north.

Q. You may state whether or not, as disclosed by Oregon's Exhibit No. 5, the depths in Baker's Bay have shoaled or deepened since the map of Oregon's Exhibit No. 4 was made.

A. Yes, there is a considerable shoaling as shown by the map of 1854 as compared with that of 1851.

Q. What is the relative position of Sand Island as shown by those two maps, Oregon's Exhibit No. 4, and Oregon's Exhibit No. 5.

A. On the map of 1851 Sand Island does not appear above high water, while on the map of 1854 it shows as dry, or portions of it dry at high water.

165 Q. You may state whether or not Sand Island had moved in any direction, north, south, east, or west, or had grown in territorial extent.

A. Sand Island as shown on the map of 1854 had moved approximately ¼ for a mile in a north northwest direction.

Q. Now I wish you would take up the south channel, as shown by Oregon's Exhibit No. 5, and give a description of it, comparing it with the south channel on Oregon's Exhibit No. 4.

A. The entrance of the south channel, as shown by the map of 1854, is more to the eastward than it was in 1851, but that shows the ruling depth of water to be 3¾ fathoms as compared with only 16 feet in 1851. (1851)

Q. Did you give the ruling depths of the south channel? If not, I wish you would do so.

A. The ruling depth of the entrance of the south channel I gave as 3¾ fathoms.

Q. And how about the ruling depths above the entrance?

A. The depths inside of the entrance of the 1854 south channel are practically the same as those shown on the 1851 map.

Q. You may state whether or not sailing directions are given upon that map.

A. Yes, complete sailing directions are given on this map of 1854 for both the north channel and the south channel.

Q. I think I inquired of you about Sand Island on this map, did I not?

A. I stated it had moved north northwest practically one quarter of a mile.

Q. Now, in examining these sailing directions, you may state whether or not both channels could be used by ocean-going vessels in coming from the sea, going to Astoria and up the river.

166 A. Under the head of "South Channel," complete sailing directions are given from the sea to anchorage in Astoria; while the sailing directions for the north channel only give from the sea to anchorage in Baker's Bay.

Q. You may state whether or not under those facts it is not probably that the south channel is the one that was generally used to Astoria and to the upper river?

Senator FULTON: That is objected to as incompetent, leading and suggestive.

A. I think that the use of that channel would depend entirely on direction of the wind.

Q. So that either channel might be used, according to the direction of the wind?

A. I think so.

Q. Now, I will inquire of you what is the next map in point of time after Oregon's Exhibit No. 5.

A. I believe the survey of 1868 published in 1874 is the next.

Attorney General CRAWFORD: I think there was a map in 1870, wasn't there?

Senator FULTON: Yes there is an 1870 map.

WITNESS: That is probably the survey of 1868.

Attorney General CRAWFORD: Yes, perhaps it is 1868.

Senator FULTON: I think it is.

WITNESS (after referring to maps): It is the survey of 1868.

Q. I desire you to take Oregon's Exhibit No. 9, which was published, I believe in 1870, with the hydrography of 1868, and state what channels, if any, are shown upon that map?

A. Two bar channels are shown—one north channel and one south channel.

Q. We will first take up the north channel, and I will ask

167 you to state how it compares with reference to location with the north channel of the last map to which you referred, Oregon's Exhibit No. 5.

A. The entrance to the north channel is farther north than it was on the previous survey, having been pushed northward by the building up of the Middle Sands.

Q. Approximately how much farther north does the north channel appear?

A. It is fully one mile farther north.

Q. What is the ruling depth of the north channel as shown by Oregon's Exhibit No. 9?

A. The ruling depth of the entrance of the north channel is about 3½ fathoms.

Q. You may compare the depth in Baker's Bay, as shown by Oregon's Exhibit No. 9, with the depths shown in Oregon's Exhibit No. 5?

A. The least depth of that channel in Baker's Bay is about 3½ fathoms.

Q. You may state, then, whether or not the water in Baker's Bay, as shown by Oregon's Exhibit No. 9, was shoaling or increasing in depth since the last survey, as shown by Oregon's Exhibit No. 5.

A. The channel through Baker's Bay seems to be shoaling and narrowing up considerably.

Q. You may examine Sand Island as shown on Oregon's Exhibit No. 9, and compare its location with that shown on Oregon's Exhibit No. 5.

A. Sand Island has moved north-northwest between three-quarters of a mile and one mile.

Q. You may state whether or not the area of Sand Island as shown on Oregon's Exhibit No. 9, is greater or less than that shown on Oregon's Exhibit No. 5.

168 A. That portion above high water is very much greater than it was in 1854.

Q. I understand that the surveys as given upon Oregon's Exhibit No. 9, are the next in point of time to those shown on Oregon's Exhibit No. 5.

A. Yes sir.

Q. And that there were no intermediate surveys as far as you have been able to ascertain?

A. Not as far as I know.

Q. Now, you may state whether or not vessels using the north ship channel as shown on Oregon's Exhibit No. 9 would pass north or south of Sand Island as shown on that map.

A. It would pass north of it.

Q. You may describe now the south channel with reference to the south channel as shown on Oregon's Exhibit No. 5.

A. The south channel on Oregon's Exhibit No. 9 seems to enter in practically the same position as that shown on Oregon's Exhibit No. 5, except that it is practically twice as wide and has a least depth of 4¼ fathoms.

Q. Vessels in passing up that channel necessarily pass south of Sand Island?

A. Yes sir.

Q. You may state whether or not there are any sailing directions given upon that map.

A. I see no sailing directions on this map.

Q. No sailing directions at all?

A. No.

Q. Is there anything upon that map to indicate which would be the more preferable channel for ocean going vessels in passing to Astoria and points further up the river?

A. No sir, both channels are buoyed.

169 Q. So that the facts which would determine the use of either *chane* channel would be the prevailing direction of the winds, probably?

A. Hardly, because the depth of the south channel is 4¼ fathoms while that of the north channel is only 3½ fathoms.

Q. Then the south channel would be preferable so far as depths are concerned?

A. It is the deeper one.

Q. And the straighter one and the wider one?

A. The straighter one and the wider one.

Q. What is the next map in point of time? Or let me ask you this question first: The hydrography of this map is of 1868, is it not?

A. Of 1868.

Q. And what was the date of the hydrography of the next preceding map?

A. The hydrography of Oregon's No. 5 exhibit was 1852. The map was published in 1854.

Q. And I understood you to say a few moments ago that there were no intermediate surveys?

A. I never knew of any.

Q. What is the next survey in point of time after Oregon's Exhibit No. 9, the hydrography of which appears to be that of 1868?

A. I don't remember without refer-ing to the records. I think it was 1881. (After referring to government reports.) It is given here as 1876, 1878, 1879 and 1880.

Q. Do you know whether or not maps showing those surveys have been introduced in evidence?

A. I don't think they were ever published. They were just examinations. They were not surveys—just examinations.

Q. What is the next survey in point of time after 1868 which has been introduced in evidence already in this case?

170 A. That has been introduced in evidence?

Q. Yes. You are familar with all these maps that have been introduced in evidence, are you not?

A. Washington's Exhibit H, I think is the map of 1905.

Q. Please examine Washington's Exhibit H and describe the ship channels which are shown upon that map. First, let me ask you what is the date of the hydrography which appears on Washington's Exhibit H as it came from the office of the Coast and Geodetic Survey?

A. The hydrography of the entrance from Survey Corps Engineers U. S. A. 1905.

Q. Now, what channels across the bar are shown under the hydrography of 1905.

A. There is only one channel across the bar.

Q. Where is that?

A. That is shown by the black line marked "1905 Channel Line."

Q. How does that channel compare with the channel as shown on Oregon's Exhibit No. 9?

A. On Oregon's Exhibit No. 9 there are two channels—one north and one south channel.

Q. And these two channels have joined into one in 1905?

A. In 1905, yes.

Q. The black line, then, marked "1905 Channel" shows the existing ship channel under the hydrography of 1905 up as far as that map goes?

A. Yes sir.

Q. You may state whether or not that black line indicates the course which would be pursued by ocean-going steamers and vessels in coming from the ocean to Astoria and Portland.

A. The black line marked "1905 Channel Line" follows practically the line of the deepest water and is the channel marked by buoys and other aids to navigation for the passage of deepest draught vessels.

171 Q. You have obtained this line, as I understand it, from an examination of the government charts, surveys, maps, etc., as well as by your personal knowledge gained from several years' experience in surveying that portion of the river?

A. Yes sir, from personal experience and from location of buoys and my own knowledge of the waters shown on that sheet.

Attorney General CRAWFORD: That refers, I suppose, to the present channel lines?

Mr. MACDONALD: Yes, the present channel line. We refer to the present channel line.

WITNESS: Yes, the present channel line.

Q. I wish you would explain what changes, if any, have occurred in Sand Island as shown on Washington's Exhibit H as compared with Oregon's Exhibit No. 9.

A. Sand Island has moved bodily between half and three-quarters of a mile north, and has increased in area many times.

Q. Please be good enough to state what changes, if any, have occurred in the depths of Baker's Bay as shown on Washington's Exhibit H as compared with Oregon's Exhibit No. 9.

A. The depths in Baker's Bay north of Sand Island are very much less than was shown on Oregon's Exhibit No. 9.

Q. You may state whether or not Washington's Exhibit H gives the ruling depths of the channel between Cape Disappointment on the west and Sand Island on the East at the nearest point.

A. You said the ruling depth?

Q. The ruling depth.

A. The ruling depth between the two points just mentioned by you is 12 feet. All depths refer to low-water.

Q. Is that the least depth also between those two points?

A. No sir.

Q. What is the least depth between those two points?

A. The least depth is practically no water at all between

172 the two points.

Q. You may state whether or not a sufficient depth of water exists in the channel north of Sand Island to admit of the passage at this time of ocean-going steamers or vessels.

A. No sir; such depths do not now exist.

Q. I will ask you to state whether or not you are familiar with the channel from Ilwaco north of Sand Island to Astoria.

A. I am.

Q. You may state what the ruling depths of that channel are at low-water.

A. The ruling depth of that channel is about 3 feet at low-water, this depth occurring near the head of Sand Island.

Q. You may state whether or not you personally know what (if any) vessels or boats use the channel there.

A. There are several boats using it now, one using it daily.

Q. What is the character of those boats with reference to the draught of water?

A. The steamer I just referred to is the Steamer Hakicotte, which runs between Astoria and Ilwaco.

Q. At what times is it able to use the channel north of Sand Island and into Ilwaco?

A. This steamer can only pass in or out of Baker's Bay at about half tide. This steamer draws not over six feet of water.

Q. You may state whether or not at the present time it is possible for ocean going vessels or steamers to pursue a course from the ocean to Point Ellice which would be shown by the blue line on Washington's Exhibit H denominated "Boundary Line as Claimed by the State of Oregon."

A. It would be unsafe for any steamer of any draught to take such a course now.

173 Q. Well, do any ocean steamers take such a course?

A. No sir.

Q. I will ask you to state whether or not you are able to state from your examination and investigation into this subject, a channel which would be shown and delineated by this blue line marked "Boundary Line as Claimed by the State of Oregon" has ever been used by ocean-going vessels in coming to Portland.

A. The depth as shown on the various surveys would indicate that no steamers could at any time have gone as far north as that line indicates; that is, ocean-going vessels.

Q. I will ask you to state from your observation and personal knowledge of the river whether ocean-going vessels in going to Portland have ever used a course approximating that shown by the blue line to which I have just referred covering a period, we will say, of the last fifteen years.

A. No sir, not to my knowledge.

Q. You may state what course, during your personal knowledge of the river, vessels have pursued in coming from the ocean to Portland.

A. All ocean-going steamers and vessels of any kind have always passed by Point Adams, following the south channel up by Tansy Point, and thence up to Astoria.

Q. And on up the river?

A. And on up the river.

Q. I will ask you to state what the depth of water is at the present time opposite Point Ellice—just off Point Ellice.

A. The map shows that the greatest depth south of Point Ellice at the present time is 85 feet.

Q. How far does that deep water extend east or west of Point Ellice?

174 A. That depth is found nowhere else east or west of it.

Q. What area would that depth cover—a considerable area, or is it a pocket?

A. That is a pocket of deep water, a pocket of considerable size.

Q. What is the depth of the channel opposite Astoria?

A. The main portion of Astoria?

Q. Yes.

A. This map, which is Washington's Exhibit H, shows a depth of 55, 57 and 59 feet; that is the deepest.

Q. You may state whether or not the ruling depth of the water from Chinook Point to Knappton is more than abreast of Astoria.

A. No sir, it is very much less. Opposite Knappton, this chart shows the depth of water to be 12, 16, 18 and 21 feet.

Q. You heard the testimony the other day of Capt. Jordan in which he said the depth of water from Chinook Point to Knappton was much greater than abreast of Astoria.

A. It would be except that when you got up towards Knappton, where it decreases.

Q. But the depth of the channel as a whole from Chinook Point to Knappton would then be less than that abreast of Astoria?

A. No, from Chinook Point and up by Point Ellice, a short distance east of Point Ellice, would be greater than it is at Astoria.

Q. Greater than it is at Astoria?

A. Yes.

Q. As shown by Washington's Exhibit H.

A. As shown by Washington's Exhibit H.

Q. What is the ruling depth of the water in the channel
175 as shown here east of Point Ellice on Washington's Exhibit H?

A. This line here (pointing on map)?

Q. Both of them.

A. Both lines. In the channel that runs from Point Ellice to Knappton the depths of water are as follows, commencing at Point Ellice and taking about the middle channel depths; 85 feet, 74, 52, 27, 43, 50, 35, 38, 21 and 12.

Q. Those figures that you have just enumerated are feet, are they not?

A. Are feet, in low-water.

Q. I think I misspoke myself in asking you a question a few moments ago, and I will ask it again. What is the fact with reference to the channel from Chinook Point to Knappton as a whole channel, as an entirety, being less or greater than the depth of the water abreast of Astoria?

A. I answered that the depths were greater from Point Chinook to Point Ellice and a short distance east of Point Ellice than Astoria; but as you come up to Knappton the depths are very much less.

Mr. MACDONALD: That is what I wanted to get at. Capt. Jordan said that the water from Chinook Point to Knappton was deeper than the water abreast of Astoria.

Q. Are you familiar with the dredging which has been done in the river, that portion of the river shown on sheet No. 1, Washington's Exhibit H, in the last fifteen or twenty years?

A. Yes sir.

Q. You may state briefly the amount of dredging which has been done and the places where that dredging has occurred.

A. No dredging has been done below Astoria, to my knowledge, except that the dredge "Chinook" was put to work below Astoria for perhaps six or seven days to dredge in the channel for the
176 purpose of breaking in the crew in order that they might be informed as to their duties when dredging operations on the bar were begun. Above Astoria, as shown on Washington's Exhibit H, some dredging was done where the present 1905 channel line ends, which is the channel that passes up the river and beyond Tongue Point.

Q. Has any dredging ever been done along the channel following the Washington shore, on Washington's Exhibit H?

A. No sir, I never heard of any, not since I came down.

Q. A witness testified upon the stand the other day that it would require more dredging to keep the south channel open and available for navigation than would be necessary to maintain the north channel.

A. It would take more in the south?

Q. Yes. I will ask you to state the facts and give your opinion upon that.

A. I think the witness is misinformed or else he didn't understand the question.

Q. What is the fact, then, relative to the amount of dredging which would be required to keep the north and the south channels open as shown on Washington's Exhibit H and Washington's Exhibit I?

A. To dredge the north channel as shown on Exhibit I, would require a channel to be dug nearly three miles where depths now existing are on an average of 10 to 12 feet below low-water; while in the south channel, or at least the present channel, the dredging is done where the depth of the water is about 18 feet, and the distance does not exceed one mile.

Q. There is a channel shown by our black line marked "1905 Channel?"

A. Yes sir.

Q. I believe that you in person fixed or supervised the fixing of the initial point of this 1905 channel?

177 A. Yes sir; Mr. Jussen and I talked that over several weeks ago and from the records and charts etc., established that point.

Q. I wish you would describe fully and in detail the manner in which you arrived at that initial point.

A. That is, the point commencing one marine league at sea due west?

Q. One marine league at sea and opposite the north ship channel. Due west and opposite the north ship channel of the Columbia River.

A. On the chart of 1854 the ranges giving the sailing directions indicate the mouth of the north channel. These lines are shown on this map, which is Washington's Exhibit H, in red lines, and the channel line is marked the "North Channel." This was the initial point taken as the middle of the mouth of the north ship channel.

Q. Then you produced a line one marine league due west of that point?

A. Yes sir.

Q. Which would be the juncture of the black line marked "1905 Channel Line" and the red dotted line marked "One Marine League due west?"

A. That is identically the place.

Q. And then in the producing of that north channel line you simply took the maps, charts, surveys, beacons, buoys, and other information to fix your present ship channel?

A. Yes sir.

Q. In the Act of Congress which created the Territory of Washington, the following description occurs: "All that portion of Oregon, while the state was a territory, lying and being south of the
178 49th degree of north latitude, and north of the middle of the main channel of the Columbia River from its mouth to where the forth-sixth degree of north latitude crosses that river," the date of the Act was 1852. I wish that you would take the map published by the government nearest to 1852 and tell us where such line would carry on it.

A. The map of 1854 is the hydrography of 1852, and that is the hydrography as shown on Washington's Exhibit H, in red.

Q. Which is the main channel of the Columbia River from its mouth, then, as shown by the nearest date of 1852?

A. According to the sailing directions the south channel is the main channel, the one most usually used.

Q. And that is the one delineated on Washington's Exhibit H, as the south channel line — 1854?

A. According to the sailing directions it is the safest channel.

Q. And that south channel line — 1854 on Washington's Exhibit H, would indicate the middle of the channel then, of the river?

A. According to the sailing directions, yes sir.

Q. In the Act of Congress admitting the state of Oregon, into the sisterhood of states, the description of the boundary line so far as it is material to this controversy reads as follows: Beginning one marine league at sea, due west from the point where the forty second parallel of north latitude intersects the same; thence northerly at the same distance from the line of the coast lying west and opposite the state, including all islands within the jurisdiction of the United States to a point due west and opposite the middle of the north ship

channel of the Columbia River." Now that is the point which we have named the initial point of this line. The description then follows: "Thence easterly to and up the middle channel of the
179 said river, and where it is divided by islands, up the middle of the widest channel there of," etc. I will ask you whether or not you have been able to find a middle channel as existing in 1859, or whether such middle channel is shown by the maps published nearest to that date?

A. At that date there appears to be no middle channel.

Q. When did a middle channel appear?

A. I think in 1870, or about that time.

Q. Where did the channel appear in 1870? I wish you to be specific as to that date.

A. The survey of 1868, which was published in 1870, shows a channel opening up just north of Desdemona Sands and adjoining the deep pocket extending below Tongue Point and north of Astoria.

Q. Was that a channel of considerable size and one which could be used in the navigation of large ocean-going vessels?

A. I never saw any ocean-going vessels going up that way.

Q. Then, so far as you know, that channel never was used by the ocean-going vessels?

A. Not by ocean-going steamers, no sir.

Q. You may state whether or not that channel exists at the present time.

A. Yes sir, I think so.

Q. Is it of sufficient depth to admit of the passage of ocean-going vessels and steamers?

A. No sir.

Q. Is it used for anything else but very light draught boats and small steamers?

A. No sir. Only for light-draught steamers.

Q. And is not the channel now used in going to Astoria and Portland?

A. No sir.

Q. And has not been used for several years?

180 A. Not since I came down to the mouth of the river.

Stipulation.

It is hereby stipulated and agreed by and between the parties hereto that the signature of witnesses to the testimony taken before the respective Commissioners of the parties shall be and is hereby waived, and the testimony of the witnesses of both parties when extended from stenographic notes into typewriting and duly certified by the Commissioners hereto shall be taken and accepted as though actually signed by the witnesses.

The hearing adjourned until July 17, 1906, at 10 o'clock A. M.

181 THE BREAKERS, PACIFIC COUNTY,
WASHINGTON, *July* 17, 1906.

The taking of testimony was resumed before the Commissioners at the above place and time.

G. B. HEGARDT was recalled, and his direct examination resumed as follows:

By Mr. MACDONALD:

Q. I wish that you would consult Washington's Exhibit H, and you will find thereon at various places the word "Anchorage." I wish you would explain what that means and what the purpose of that is.

A. As shown on Washington's Exhibit H, going into Baker's Bay, from the survey of 1854 there is an anchor placed in red, indicating this point as a safe anchorage for vessels. The next anchorage place I find on this map is about 1¼ miles north of Point Adams, also from the 1854 survey, and showing an anchor in red, and marked, "lower anchorage." Then proceeding by Point Adams and up the main ship channel to Tansy Point, from the survey of 1851, an anchorage is again placed in green and the writing "Clatsop Anchorage." Then as we proceed up the main channel again to Astoria there is an anchor placed directly opposite and north of Astoria, also in green, but without writing. Then there is one more anchorage shown on the same map which is west of the writing "Old Saw-mill."—indicating also that this is a safe anchorage.

Q. You may state what the custom is with reference to platting anchorage grounds upon maps issued by the Coast and Geodetic Survey as to whether those anchorage grounds are put in channels or elsewhere.

A. In navigable channels only.

Q. In navigable channels only?

A. Yes.

182 Q. Do you know what the custom is with reference to platting those in all navigable channels?

A. No sir, I do not know.

Q. You don't know whether it is the custom to put them in every navigable channel or not?

A. I have never seen them placed anywhere except in navigable channels. They may be placed in pockets at the ending of a channel.

Q. I wish you would briefly state the changes which have occurred in the north channel in Baker's Bay since 1840 and 1851.

A. From the maps published since that time it is shown that the north channel in Baker's Bay has deteriorated in depth and width since 1840 and 1851.

Q. You may state whether or not that deterioration has been of a sudden character or gradual.

A. Gradual only, very gradual.

Q. And has continued through all these years, did I understand you to say?

A. Yes sir, gradual changes.

Q. With reference to the middle channel in the Columbia River I will ask you as of what date that middle channel has been put upon any government map which is introduced in evidence.

A. The first chart on which the middle channel is shown is the survey of 1868, and I think it gives the depth of water. (Referring to Oregon's Exhibit No. 9.) At the lower end of and about north of Desdamona Sands, there is a channel in which the depth of water at least depth is 3¾ fathoms, and this depth is maintained and increased for a considerable distance until a point is reached due north of Smith's Point, Astoria, where the least depth shown is 3¼
183 fathoms, when it again enters into deep water west and north of Tongue Point, thus making a continuous channel.

Q. The ruling depth of that channel, then, is 3¼ fathoms?

A. Yes sir, of that date.

Q. Now, I will ask you to take the map next preceding Oregon's Exhibit No. 9, next in point of time, which I believe is Oregon's Exhibit No. 5, and ask you to give the depths in the same place as the middle channel appears on Oregon's Exhibit No. 9.

A. The survey shown on Oregon's Exhibit No. 5, did not extend up that far.

Q. Then there is no means of determining?

A. No sir, except by the 1851 survey.

Q. Will you turn to the 1851 survey and tell us what that shown?

A. There is no channel on that map which would indicate mid channel.

Q. What is there? Are there sands?

A. There is a large area of sands shown as "Bare at low water."

Q. Bare at low water?

A. Yes.

Q. Those sands appear in Oregon's Exhibit No. 4, in the same place as the main channel appears in Oregon's Exhibit No. 9?

A. Part of the sands, the north part of them.

Q. Now I wish you would state how long that middle channel continued.

A. It exists at the present day.

Q. Can you state how long it existed as a navigable ship channel?

A. It never was a navigable ship channel; was never use- as such.

Q. And it not now a navigable ship channel?

184 A. No sir.

Q. I wish that you would briefly give us a history of Sand Island and its movements.

A. Sand Island first appears on the survey of 1839, which is Sir Edward Belcher's survey, when parts of it are shown as bare at low water. The formation of the sands now called Sand Island, are undoubtedly the lower end of Desdamona Sands, and were cut off from the Desdamona Sands by the action of the currents in early years. At that time P int Adams did not extend out as far as it does now, and there were two defined channels—a north and south

channel—divided by the Desdamona Sands as far as they extended, or approximately to a point occupied by Sand Island as first known.

Senator FULTON: Right there I would like to interrupt the witness to interpose an objection to those statements on the ground that he has no personal knowledge whatever and as expressing mere theory on the part of the witness, hence the testimony is incompetent.

Q. Proceed, Mr. Hegardt.

A. There were undoubtedly two main currents passing down the Columbia River—one north of the Desdamona Sands and one south of the Desdamona Sands, and by the action of waves and winds and other forces the lower end of Desdamonda Sands was cut off or detached, thus forming an island or a bar which gradually grew in height and in area until it formed what is now known as Sand Island. I think that explains the origin of Sand Island.

Q. What is the latest map prior to the admission into the Union of the State of Oregon?

A. The map of 1854.

185 Q. Taking the map of 1854, I wish you would show where the middle of the north ship channel is.

A. On Washington's Exhibit H, the survey of 1854 is shown in red. On this same map, still continuing on the 1854 survey, there are two channels marked—north channel and south channel. In the sailing directions also shown on this drawing, the directions are given for entering the mouth of the river by either channel, and these sailing directions for both channels meet in one point where the ranges are given. Taking the north channel, there is one range that goes to Coxcomb Hill and another one that goes to some point on the Washington shore, and the point where these two ranges meet is shown to be directly in the middle of the entrance of that north channel. The same explanation also holds good for the south channel.

Q. Then, as I understand it, the middle of that ship channel is at the intersection of these red lines, one running horizontally and marked one marine league due west, and the other a dotted line, being a range line through from Coxcomb Hill?

A. Yes sir.

Q. You heard the testimony of State Engineer Lewis of Oregon the other day, did you not?

A. Yes sir.

Q. Wherein he fixed the entrance or the mouth of the north ship channel at the point just south of Cape Disappointment, being the most easterly end of a straight blue line terminating just south of Cape Disappointment under which the word "Boundary" appears.

A. I heard that testimony.

Q. Now, you observe the words "Peacock Spit" in red ink upon sands just north of a black line on Washington's Exhibit

186 H, and near the figures "1905" and just above them the word "buoy." I will ask you whether or not a ship channel existed between the word "buoy" and Cape Disappointment, almost immediately due north of it, in 1854?

A. Yes sir; the channel passed due east of that point called Peacock Spit.

Q. Was there a ship channel going from that point due west?

A. No sir.

Q. Was it possible at that time for ocean-going vessels or steamers to come from the ocean in above this blue line marked "Boundary" to Cape Disappointment?

A. The map would indicate that no channel existed at that time in that place.

Q. Then, the commencement of that channel would be at this point which you have marked or designated on here as the mouth of the ship channel?

A. That is the mouth of the ship channel, and farther in there is the gorge or throat of the channel.

Q. What do you understand to be the mouth of a ship channel?

A. The mouth of a ship channel is where the vessels enter it or where they leave it behind when passing out.

Q. That is, where they leave it from the ocean?

A. From the ocean.

Q. What is the depth or condition of the river at the present time at the point where Sand Island first appears to have been shown on any map?

A. I will have to get the survey of 1839 for that, Sir Edward Belcher's survey.

Map No. 3, of Washington's Exhibit C, was handed to the witness by Mr. Macdonald.

187 WITNESS: Sand Island first appears on the survey of 1839, and where it then existed there is now a depth of water, as shown on Washington's Exhibit H, in black, of 50 feet or over.

Q. Can you give briefly a history of the two channels which appear on Washington's Exhibit H, east of Point Ellice and close to the Washington shore, taking the northerly channel which passes by Hungry Harbor, Cliff Point, U. S. Quarantine Reservation, Knappton?

A. This channel is quite deep and wide just east of Point Ellice, and passing up close to the Washington shore the depths are maintained for a least depth of about 30 feet as far up as the United States Quarantine Reservation. At and opposite Knappton this map shows that the depth of water is about 12 feet and beyond this point the channel narrows down until it is lost, probably about half a mile east of Knappton.

Q. Those depths which have just been given are of what date?

A. Of 1905.

Q. I observe upon this map and through this channel certain figures in green; what do those indicate?

A. Those were taken from a survey of 1851.

Q. How do the depths of that channel compare by the surveys of 1851 and the last surveys shown upon this map, Washington's Exhibit H?

A. The depth of water in 1851 was very much less than at the present time.

Q. Now, I would be glad to have you take up the southern channel close to the Washington shore, immediately east of Point Ellice, and give us a brief history of that channel as disclosed by surveys which have come under your observation and examination.

Senator FULTON: I wish to interpose an objection to this testimony, as it is not based on the personal knowledge of the
188 witness, but simply a statement of what appears on the published maps and a statement of the theories of the witness based thereon, and consequently, is incompetent.

A. This last mentioned channel also commences wide and deep just east of Point Ellice. Then it continues in a north-northeast direction for some distance, with considerable depths ranging between 45 to 30 feet of water until the end of the sheet is reached, when the depth decreases and this channel dies out or is lost, as shown on Washington's Exhibit I, about one mile east of the west line of that map.

Q. Now we will pass to Washington's Exhibit I. I believe you testified yesterday that the blue line thereon marked "Boundary Line as claimed by the State of Oregon" was reproduced on this map by you from the lines shown on the map attached to Oregon's answer.

A. It was.

Q. I wish now that you would take up the lines in red marked "1859 Channel Line" and describe that line, stating what it indicates, including the line which passes south of Snag Island through Woody channel. Just describe what that line indicates and the sources from whence you obtained your information to draw that line.

A. The buoys, beacons, and aids to navigation shown on either side of the 1859 channel line and part of the channel line marked 1875 were taken from the 1875 map, from surveys made in 1867 and 1868.

Q. You may state what was the ship channel used at or about 1859 upon that portion of the river shown on Washington's Exhibit I.

Senator FULTON: I object to that because it discloses no
189 personal knowledge on the part of the witness, the testimony is incompetent.

A. Previous to the survey of 1867 and 1868 the channel used for ships going up to Portland was what is known as the Woody Island channel, as a matter of record.

Q. You may state whether or not that channel is shown upon Washington's Exhibit I, and, if so, by what?

A. It is shown by a red line commencing on the first part of the sheet and continuing up as far as indicated by the red line.

Q. And that passes, then, in that southerly channel, Woody Island channel, which is south of Snag Island; do I so understand you?

A. Yes sir.

Q. You may state, if you know from your examination of the records and maps, how long the south Woody Island channel being south of Snag Island, was used.

A. The Woody Island channel south of Snag Island was used until 1867 or 1868 when surveys were made by Cordell, who discovered a channel which was afterwards named after him and which passes north of Snag Island.

Q. Is that the channel marked on this map "Cordell channel".

A. Yes sir, north of Snag Island?

—. ——.

A. Yes, sir.

Q. Do you know how long the Cordell channel continued to be used as a ship channel?

A. The Cordell channel was abandoned in 1882.

Q. You may state, if you know, why it was abandoned in 1882.

A. It was on account of continual shoaling.

Q. You may state whether or not the government has constructed or erected any dikes or works in the vicinity of Sand Island.

190 A. The Port of Portland constructed a dike passing through Snag Island as shown on Washington's Exhibit I.

Q. Do you know whether or not the Port of Portland Commission was under the supervision of any department of the Federal Government in doing that work?

A. They were under the supervision of the U. S. Engineering Department.

Q. The Engineering Department of the United States Army.

A. Yes sir.

Q. I wish you would indicate upon Washington's Exhibit I, the location of this jetty as constructed by the Portland Commission under the supervision of the United States Engineering Corps.

A. This jetty is built each way from Snag Island, one leg of it passing due west and one passing up stream in a northeasterly direction.

Q. Those are two black lines which meet at Snag Island at an obtuse angle?

A. Yes sir.

Q. Let me inquire again the date of the construction of that jetty.

A. I think it was built in 1892 or 1891.

Q. What was the effect of the construction of that jetty?

A. The effect of the construction of that jetty was continued shoaling.

Q. Continued shoaling of what channel?

A. The old Woody Island channel.

Q. It effectually closed up entirely the Cordell channel, did it not?

A. Yes.

Q. And I understood you to say it shoaled the Woody

191 Island channel.

A. It shoaled the Woody Island channel.

Q. Thereafter was the Woody Island channel used as a ship channel by vessels and steamers in coming from the ocean to Portland?

A. No sir, not since the construction of the Snag Island jetty.

Q. Are you aware of the direction from which the current comes from the Columbia River east of Three Tree Point?

A. Yes.

Q. From what direction does it come?

A. It flows down westerly.

Q. No, I mean east of Three Tree Point, what direction does that current come from.

A. Oh, East? It comes from an easterly direction.

Q. A due easterly direction?

A. No; in an easterly direction.

Q. What is the natural direction of the flow of that current after it strikes the Washington shore at Three Tree Point?

A. The natural tendency of the flow of the water pas-ing Three Tree Point is to be deflected by Jim Crow Point and pass down through the Woody Island channel.

Q. You may state whether or not in the absence of artificial aids the channel of the river would naturally flow along the north shore of the river close to Washington, or whether it would be deflected and pass down towards Snag Island.

A. The natural tendency of the water is to follow the Woody Island channel through.

Q. I wish now that you would take up this black line, marked "1905 channel" and describe that if you please; what it indicates and from what you obtained your information to draw it.

192

A. The black line marked "1905 channel line" indicates the present direction and location of the main ship-channel between Tongue Point and Harrington Point. The position of this channel——

Q. May I interrupt you there just a moment? Harrington Point does not appear to be marked upon Washington's Exhibit I, and I will ask you to indicate it.

A. It is practically the same point called Yellow Bluffs on this map.

Q. That is just north of where the blue line and the black "1905 channel line" intersect or join.

A. Yes sir.

Q. Now kindly proceed.

A. The position of this channel was obtained from the United States Lighthouse Department in Portland where the actual location of buoys and beacons was obtained and platted directly on this map from such information.

Q. You may state whether or not that "1905 channel line" indicates the course now taken by ocean going vessels.

A. All ocean going vessels passing to Portland or returning from Portland to the sea take this channel.

Q. You may state whether or not anything appears upon this map which indicates the present ship channel, the main ship channel, of the Columbia River up the river from Tongue Point.

A. I don't understand that question.

Q. Is there any line upon this map which indicates the present main ship-channel?

A. Yes.

193 Q. Beyond Tongue Point, going towards Portland.

A. The line in black marked "1905 channel line."

Q. That indicates and marks the present ship-channel?

A. The present ship channel.

Q. Now, I observe upon this map a little circle with the letters "F. H." upon it, at almost the extreme left hand side of this map. Please tell me what that means.

A. That is an abbreviation of Fish House on Taylor's Sands.

Q. Is that fish house an object that is referred to in the sailing directions?

A. Yes sir, there is a light on that.

Q. In the sailing directions as published by the Federal Government?

A. It is under aids to navigation.

Q. By whom are "The Aids to Navigation" published?

A. I think they are published by the United States Lighthouse Department.

Q. A little bit farther on, I observe another black mark with the letters "G-A-S."

A. *Gas.*

Q. What does that indicate?

A. That is a gas buoy, which is continually lighted.

Q. By whom is that buoy maintained, if you know?

A. By the Lighthouse Department.

Q. For what purpose?

A. As an aid to navigation.

Q. I observe in blue, immediately underneath that buoy another one marked "No. 1" What does that indicate?

A. The beacons and buoys marked in blue refer to the

194 1875 channel line.

Q. And I notice one marked "No. 1 beacon" in red. To what does that refer?

A. That means that steamers and ocean going vessels passing up the channel must leave that on the right side going up.

Q. Is that a beacon that is now in actual use?

A. Yes sir.

Q. And now serving as a means of guidance to mariners in coming up?

A. The ships must pass between the red beacon marked No. 1, and the gas buoy. Ships in coming up the river leave red buoys on the right and black buoys on the left?

Q. I observe here south of this 1905 black channel line, after passing No. 1, beacon, another beacon marked No. 4½; another

No. 6; another No. 6½; another No. 8 and another No. 12. I will ask you to state what these are and what purpose they serve and by whom they are maintained.

A. They are buoys and beacons maint-ed by the United States light house department, and these buoys and beacons indicate that they must be left on the right hand side of ships passing up the channel.

Q. You may state whether or not those beacons are now in use?

A. All those beacons and buoys shown on Washington's Exhibit I, were in use and force about three weeks ago.

Q. And then indicated the ship channel?

A. The ship-channel.

Q. I observe upon the north of this black line passing the buoy marked "Gas" which you have already testified to, black spar No. 1½, black pile, with a little circle just above it, and a black beacon where the blue line and the black line intersect marked "Gas." Please state what those are.

195 A. Those buoys and beacons are to be left on the left hand side as vessels pass up to Portland.

Q. You may state whether or not any other beacons, buoys or aids to navigation are planted in channels south or north of that marked "1905 channel," as in effect now.

A. As far as I know there are none.

Q. And the beacons and buoys you have referred to are the only ones in that part of the river embraced in Washington's Exhibit I?

A. So far as I know there are no other beacons or aids to navigation.

Cross-examination.

By Mr. CRAWFORD:

Q. Mr. Hegardt, when did your first acquaintance with the Columbia River begin?

A. In November, 1888.

Q. And how old a man are you?

A. I am 47.

Q. Then any testimony you have given prior to 1888 is not from personal knowledge?

A. No sir.

Q. But is derived from the plats and aids to navigation and things of that kind, is it?

A. Yes, and from general study of the conditions that existed from the earliest known history, as I have had to write all the reports on the subject and collect all the information that is now obtainable.

Q. That information, though, was not from personal knowledge?

A. No sir.

Q. It was gathered from records?

A. From records.

196 Q. And from people prior to your day. And therefore your testimony in explaining those maps and the currents is

simply your opinion from information received rather than from personal knowledge.

A. Certainly.

Q. Now, you spoke about the Vancouver survey. Do the records which you have examined show how long Vancouver was in the Columbia River?

A. No sir, not that I know of.

Q. You have no information upon that point?

A. I have no information upon that point. I have read something about his coming into the river, but how long he remained in here I don't know.

Q. What do you mean by the Belcher map that you referred to?

A. That is the map of 1839.

Q. How was that made; that is, who made it?

A. If I may refer to the records I can explain that.

(Mr. Macdonald places the Belcher map before the witness.)

WITNESS: That long description of Sir Edward Belcher's Admiralty chart of 1839, in Washington's Exhibit C, on page 11 occupying about half a page.

Q. That was in no way official, was it?

A. I understand that the United States Engineers obtained a copy of this map directly from the English Government.

Q. Yes, but the survey was not under the official direction of any engineering department of this government.

A. Not of the United States Government.

Q. And it never has been considered as an official map?

197 A. Yes, I rather think it has been considered as of an official nature or character.

Q. In what way.

A. Sir Edward Belcher, undoubtedly, was a very good navigator and surveyor and was out here for the purpose of getting just this information.

Q. You say "undoubtedly." Have you any information to that effect?

A. I should judge so by the character of the work done on that map and the position of the various lines.

Q. You are giving your testimony, then, from just making up your mind from looking at what is put in evidence as the Belcher map?

A. Yes. I was going to say, also, when you interrupted me that the survey of 1839 (which is the Belcher survey) and that of Wilkes of 1841 agree in all essential details.

Q. That wasn't what I was asking. I simply asked you if you made up your mind as to the official character and the efficiency of the Belcher map simply from the appearance of the map itself, as put in evidence here.

A. Yes, and the surveys following it.

Q. The survey following it was not made by Belcher?

A. No; that was made by Wilkes in 1841.

Q. The Wilkes survey was under the supervision of the United States Exploring Expedition?

A. Yes sir.

Q. You spoke of Sand Island having entirely moved. I wish to ask you whether in your opinion the most southerly point of Sand Island at the present time is not what was the most northerly point of Sand Island in 1868?

A. I will have to consult the official maps in order to determine that correctly.

198 After examining the maps the witness continued his answer as follows:

A careful examination of the chart of 1870, marked Oregon's Exhibit No. 9, shows that Sand Island as it existed at that time is entirely south and clear of the present Sand Island. The distance between the most northerly point of Sand Island as shown upon the map of 1870 is about half a mile south of the most southerly line or points of Sand Island as it exists to-day.

Q. I will change the question slightly. You may state whether in your opinion there is not a point on the southern side of Sand Island, as it exists to-day, which was in the northerly boundary of Sand Island as it existed in 1868.

A. No sir, not Sand Island that was shown bare above low water.

Q. You may state whether there is not a portion of the southern side of Sand Island as it exists at the present time, which was a portion of the northern side of Sand Island as it existed in 1881 and 1882.

Q. Yes sir, I believe so.

Q. You may state whether there is not a portion of the southern side of Sand Island as it exists to-day, which was a portion of the northern side of Sand Island as it existed in 1889.

A. Yes sir, there is.

Q. Now, I wish you would explain to me what this line marked "Channel line 1905" is, on Washington's Exhibit H.

A. That line indicates the course taken by all seagoing vessels passing into or out of the Columbia River and up as far as this chart shows.

Q. You mean in the year 1905, do you?

A. Yes sir, the year 1905.

199 Q. Now you may state what this line "One marine league due west" south of the western end of said line, indicates.

A. That line indicates a due east and west line drawn one marine league due west from the middle of the north ship channel as it existed in 1854, and the westerly or outer end of this line is the initial point.

Q. You may state what you took for the mouth of the north ship channel.

A. I took as the mouth of the north ship channel that point that vessels going out to sea would pass directly into the ocean, that is where they get clear water or clearance entirely.

Q. And you take that point irrespective of its distance from Point Adams?

A. Yes sir.

Q. Or irrespective of its distance from the shore line?

A. From any shore line.

Q. You may state about how far your initial point is from the shore line?

A. That is, a line joining Cape Disappointment and Point Adams, is that what you mean?

Q. Yes, from a line joining the most southern point of Cape Disappointment and the most northerly point of Point Adams. How far west is your initial point from that line?

A. That would be practically 6½ miles due west from a line joining Cape Disappointment and Point Adams.

Q. By contour lines, you mean lines showing the edges of the channel where it is of sufficient depth on each side for vessels.

A. The 18-foot contours as shown on Washington's Exhibit H, are the lines of 18 feet depth at low water.

Q. And then the channel was supposed to be getting deeper
200 between the contour lines, is that it?

A. Inside of these 18-foot contour lines the depths may be any depth greater than 18 feet.

Q. But not less?

A. Not less.

Q. You have no evidence of any middle channel, you say, until 1868?

A. The 1868 survey is the first evidence I know of of a middle channel.

Q. You may state what you took to be the mouth of the ship channel.

A. Of the north ship channel?

Q. You may state what you consider to be the mouth of any ship channel of the Columbia River.

A. The entrance of any channel which is defined by Sand Spits sands and headlands between which ships must pass.

Q. And no matter how far that channel extended into the ocean you would consider the mouth of the channel where it entirely disappeared in the billows of the ocean?

A. That would be my idea of it, yes sir.

Q. No matter if it was 20 miles from shore?

A. If it was a delta, extending 20 miles at sea, I would still consider it the mouth of the channel.

Q. You stated that the chart of 1854, being Oregon's Exhibit No. 5, indicates the mouth of the north channel of the Columbia River. You may state in what manner you consider said map to indicate that point.

A. From the sailing directions given on this map and the range lines drawn thereon.

Q. The sailing directions are placed upon a map for the purpose of guiding navigators, are they not.

201 A. Yes sir.

Q. Referring again to Oregon's Exhibit 5, the sailing directions which are mentioned in the north channel indicate simply a course for vessels to sail when entering the river through that channel, do they not?

A. The range given on Oregon's Exhibit No. 5 for the north channel, showing a direction of northeast by north, is taken on a house located on the Washington shore and called the Johnson house.

Q. For sailing along?

A. Yes, for sailing along on that course.

Q. You may state whether or not Oregon's Exhibit No. 4 and Washington's Exhibit H are both drawn to the same scale.

A. Yes; they are both the scale 1/40000.

By Senator FULTON:

Q. You have described on Washington's Exhibit H the initial point for the north boundary of the State of Washington as being the point where the dotted red line marked "One Marine League at Sea" is intercepted by the black line marked "Channel 1905." You reached that point, I understand, by assuming that the mouth of the north ship channel of the Columbia River is at the point where this dotted line is intersected by a range line to Coxcomb Hill. These lines intersect near the point of intersection of each with the red line marked "North Channel Line 1854," do they not?

A. Yes sir.

Q. If the mouth of the river is not correctly located by you, but, on the contrary, should be located where the waters of the river pass beyond the line between the most southerly point of Cape Disappointment and the most northerly point of Point Adams, then where would be the initial point of the north boundary?

202 A. I could not reach any such interpretation of any channel entrance.

Q. I understand; but I say suppose you were mistaken and as a matter of fact the mouth of the river is where the waters pass the line I have described, then where would be the initial point?

A. I don't have to admit it is a fact or anything else?

Q. Oh, no, you are not admitting it is the fact. I am simply stating that as a hypothesis upon which to base the question.

A. Then it would be between the headland of Cape Disappointment and the northerly point of Sulphur Spit.

Q. Practically where located by Mr. Lewis, the Engineer who testified to having located the blue line as indicated on Washington's Exhibit H, and marked "Boundary Line claimed by the State of Oregon"?

A. Yes sir.

Q. I understood you to testify, in answer to a question by General Crawford, that you deemed the mouth of a river to be that point where it passed into the ocean beyond all controlling influences of shoals and sands.

A. Yes sir.

Q. Do I understand you to mean that simply because a channel is found at the mouth of a river leading between shoal places that are not exposed at low water, even, but are still shoaler than the deeper channel followed by the ships entering the river, that so long as that condition continues it still is the River?

A. Yes sir.

Q. No matter how far it is from the coast line?

A. Yes sir; because it speaks of a channel. If there was not a channel used, there would not be any use in defining it, if it was all deep water. A channel is bounded by shores or spits, and if
203 there were no spits or shoals of any kind out there it would not be necessary to define it as a channel. It would be the ocean then.

Q. Well, are there not shoals in the ocean?

A. Why, they are not considered so, I think, except coral reefs, and probably inhabited by natives of some sort.

Q. What is the character of these shoals indicated on the map on either side of this red line marked "North Channel Line" at and near where it intersects the line marked "One Marine League due west"?

A. The character of those sand spits is sand, and these spits are changeable in nature and position.

Q. How much water was there at low water in 1854?

A. On the spit north of the line marked "North Channel Line" the shallowest depths shown is 11 feet.

Q. There would be 11 feet of water there, then, at low tide?

A. At low tide.

Q. And on the other?

A. On the spit south of this channel line no soundings are given inside of 18-foot contours.

Q. How much water do you understand, then, was there on the lower or southerly side at low water?

A. It could be all the way from one foot below low water to 18 feet below low water.

Q. But certainly covered by water?

A. Certainly covered by water.

Q. Now, taking the call in the north boundary line of the State of Oregon, which is one marine league at sea due west of and opposite the middle of the north ship-channel of the Columbia
204 river, where do you understand that course to run at the time of the admission of Oregon into the Union?

A. On a due westerly line from the point just mentioned until this line intersects the main channel of the Columbia river.

Q. You understand, then, it would run from this point which you have marked as the middle of the mouth of the north ship channel of the Columbia river, due east?

A. Due east.

Q. To a point where it would strike——

A. The main or south channel of the Columbia river.

Q. Now, if you have incorrectly located the initial point, and as a matter of fact it should be located practically where it was located by Mr. Lewis, the easterly course would not bring it into the boundary line to the south channel at all, would it?

A. The easterly course would take it directly into the Washington shore.

Q. Well, does "easterly" mean east?

A. In a practically due east course, I should think. It would not

mean north or south. It might vary either way from a due east course.

Q. Suppose there was a middle channel at that time at a point a little above Point Ellice, would not a line from the point indicated by Mr. Lewis as the middle of the north ship channel one marine league east of the initial point to such middle channel, be an easterly course?

A. Not as drawn on this map, Washington's Exhibit H.

Q. What course would it be?

A. It would come down and follow the north channel line of 1854, as shown just easterly of the point just mentioned.

Q. No, but you didn't understand my question. I say what would be the course from the point marked by Mr. Lewis as the mid-
205 dle of the north ship channel just below Cape Disappointment to the middle channel I have suggested just above Point Ellice? What would be the course?

A. Starting from the point just mentioned it would practically touch the channel line of 1854 shown in red, then continue in an easterly course and join the blue line as claimed by the State of Oregon south of Chinook Point, and then follow that line as indicated.

Q. Well, would not a general course be an easterly course?

A. The course I described would be a general easterly course.

Q. And that would lead to the middle channel I have suggested?

A. It would lead to the channel you called the middle channel.

Q. In regard to the north ship channel, I understood you to say in your direct testimony that it runs out at a point just above Knappton?

A. Yes sir.

Q. What do you mean by saying that the channel stops there?

A. Because the depths ahead of that channel at Knappton run into shoal water and it is not practicable for navigation.

Q. How shoal is the water where the channel ceases to be and beyond that?

A. The depths here are shown to vary from 9 feet to more or less either way.

Q. But I call your attention to the fact that the lowest depth marked on this map is 11 feet.

A. I misunderstood your question. I thought you meant the channel directly by Knappton.

Q. Oh, you thought I meant and you were testifying in the direct examination about a small or narrow channel running up
206 immediately abreast of Knappton?

A. Yes, of Knappton.

Q. I call your attention to the fact that there is a broader and apparently deeper channel just south of that, in which it appears that the least depth at low water is 11 feet. Is that correct?

A. That is correct at the present time; that is, the chart at the present time would show that depth.

Q. Well, do any charts show a less depth of water on that line?

A. I don't know of any now.

Q. Do you not consider that a depth of 11 feet of water at low tide is a channel in the river?

A. It is not what we call a deep ship channel.
Q. Not what you would call the deepest channel, rather?
A. Not what I would call a deep ship channel.
Q. Are there not many sea-going vessels that would pass through that?
A. I never heard of one passing through it, no sir.
Q. I say are there not many sea-going vessels that might well pass through that?
A. I don't think so, no sir, except very light draught schooners.
Q. A vessel drawing 15 feet of water, for instance, would pass through at high tide, would it not?
A. It would, if the channel was buoyed or if the position was known.
Q. Well, the existence of a channel does not depend on the presence or absence of buoys, does it?
A. No, but the very fact it never has been buoyed seems to indicate it is not a very desirable channel to navigate.
Q. It seems to indicate that a better channel possibly could have been found; that is all, isn't it?
207 A. Yes, that one could be found or is in existence.

By Mr. CRAWFORD:

Q. I want to ask you if the maps introduced in evidence as having been made under the supervision of the United States Coast Survey are not presumably correct.
A. Yes sir.
Q. All of them?
A. Yes, sir, they are supposed to be.
Q. And you may state whether or not there are any islands in the Columbia river between Gray's Bay and Cathlamet Bay or in that vicinity along up and down the river.
A. That part of the estuary just described is full of islands, some above the level of high water and some above the level of low water.
Q. Now, you may state which is the widest channel between the contour lines north of Desdemona Sands and the contour lines in the channel south of Desdemona Sands for the whole length of said sands on each side.
A. That is, the condition as it exists today?
Q. As shown by Washington's Exhibit H.
A. Yes; as it exists at the present time.
Q. Well, as shown by Exhibit H?
A. We have a composite map of the 1851 conditions and the 1905 conditions.
Q. Between the green contour lines?
A. That is, from the survey of 1851?
Q. I don't know. Between the green contour lines.
A. Directly north of Desdemona Sands and directly south of Desdemona Sands?
Q. Yes.
A. The width of the channel north of Desdemona Sands, between

18-foot contours, and the channel just south of Desdemona
208 Sands, between 18-foot contours, is practically the same.

Q. In making that computation you take the little bay where it extends off into Young's Bay in the south channel, do you not?

A. Yes sir.

Q. Which is the very widest portion of that southern channel?

A. That is the widest portion of the south channel.

Q. And that south channel running easterly and the south channel extending westerly from said point narrows up each way?

A. Yes sir.

Q. The north channel from the point where you measured it, running westerly, widens, does it not?

A. It widens very much more, yes sir.

Q. And running easterly from that point it is wider than the southern channel until you get to where the channel divides?

A. Yes, for a considerable distance.

Q. Several miles?

A. For about 2 miles.

(Recess until 2 o'clock P. M.)

G. B. HEGARDT recalled as a witness on behalf of the complainant, testified as follows:

Direct examination.

By Mr. MACDONALD:

Q. Referring to Washington's Exhibit I, I wish you would describe from that the places where dredging has been done by the Federal government or under the direction of the United States.

209 A. Two points on that map show where the principal dredging has been done during the last 12 or 15 years. From Jim Crow Point west and north by Pillar Rock has been one of the hard places to keep open, and dredging has been done there very nearly every year for the last 10 or 12 years, extensive dredging too at times.

Q. How far west of Jim Crow Point has that dredging been done?

A. Just north of Pillar Rock and about half a mile on each side of that point.

Q. Has any dredging been done beyond that point to Harrington Point?

A. Not beyond the point I have spoken of.

Q. Jim Crow Point is immediately north of the old Woody Island channel is it not?

A. Yes sir, where it leaves the Washington shore.

Q. What has been the effect of that dredging so far as the channels are concerned?

A. It has maintained a ship channel north of Pillar Rock by this dredging.

Q. And previous to that time it went in a southerly direction from the Washington shore through Woody Island channel and on down to Tongue Point?

A. Yes sir.

Q. Then, so far as you are able to ascertain from an inspection of the reports, charts, maps, etc., there has always been more or less of a bar at the mouth of the Columbia River?

A. All official records show the bars have always existed at the mouth of the Columbia river.

Q. And that bar is composed mostly of sand?

A. Of fine sand.

Q. You may state whence that sand comes.

A. A great portion of it comes from up the river. During
210 freshets the Columbia river is silt-bearing.

Q. And that sand and sediment is carried by the river and deposited where?

A. On the sand spits and on the bar.

Q. You may state whether or not any sand is brought by the action of the ocean-waves from the ocean into the river.

A. The littoral current which, during the stormy months, prevails up and down the coast, going north, carried a great deal of sand up the coast, in suspension.

Q. Explain what becomes of this sand that is brought down by the Columbia river; that is to say, is it carried out into the ocean and then carried north by these littoral currents, or what?

A. When the river current meets the ocean current or a strong opposing current, it deposits sand that has been held in suspension passing down the river, and the sand that travels up and down the coast in suspension is carried also up towards the mouth of the river, and when it meets the opposing current from the Columbia river it again deposits sand, and aided by the storm waves this sand is gouged out from the spits and is added to the spits which already exist and also carried northward up the coast.

Q. What is the prevailing direction of sand movements on the coast between San Francisco harbor and Cape Flattery?

A. The tendency is always northward.

Q. Northward?

A. Yes sir. I don't say always, but during the greater portion of the year.

Q. What has been the effect of the construction by the Federal government of the jetty from Fort Stevens upon Clatsop Spit?

211 A. It has tended to retain the sand which travels up and down the coast and to build up that particular spit.

Q. That is, to retain sand on the southern portion south of the jetty?

A. South of the jetty.

Q. What has been the effect on the sand immediately north of the jetty, in close proximity thereto?

A. The movement of the sand on the bar is mostly of a local character, that is, the supply of sand from the river and from down

the coast is not now of such a great quantity as to greatly add to the amount of sand that has already moved down the river. So that the forces of the river, tide, storm waves and littoral currents shift the sands back and forth on the bar beyond the end of the jetty where it is not under control.

Q. I think you explained this morning the method by which you determined the entrance to the north ship channel?

A. Yes sir, I did.

Q. And that was arrived at by a consideration of the sailing directions on these various charts?

A. Yes sir, and the sands and headlands which border on that channel.

Cross-examination.

By Attorney General CRAWFORD:

Q. You say that the Columbia is a silt-bearing river. That is only during a small portion of the year, is it not?

A. Mostly during the time that the Columbia river is in flood or freshet.

Q. Perhaps one third of the year?

A. Yes, that would be practically all.

Q. And the rest of the time it is comparatively clear water?

212 A. Comparatively clear water.

By Senator FULTON:

Q. You spoke about dredging having been done in the river, and I think you said it was west of Jim Crow Point. At what point west of Jim Crow Point?

A. I said north of Pillar Rock and practically one-half mile on each side of it.

Q. Where is Pillar Rock?

A. It is right in here. (Pointing on map.)

Q. It is marked?

A. Yes sir.

Q. Where is the other point?

A. The other point is at what is called the Hog's Back, just north of Tongue Point.

By Mr. MACDONALD:

Q. North from Tongue Point, or Harrington Point, or Yellow Bluffs?

A. No, practically north of Tongue Point; I will say where the channel crosses the sand spit.

Q. That is in the channel leading over to Yellow Bluffs?

A. Yes.

By Senator FULTON:

Q. In the channel marked "1905?"

A. Yes sir.

Q. Practically north of Tongue Point?
A. Of Tongue Point.
Q. What space has been dredged there?
A. I think that cut varied from one-half to three-quarters of a mile.

Excused.

213 Major F. A. BOUTELLE, sworn as a witness on behalf of the complainant, testified as follows:

Direct examination.

By Mr. MACDONALD:

Q. Kindly state your name, residence and occupation.
A. F. A. Boutelle, Major United States Army, retired; at present on active duty as recruiting officer at Seattle, Washington.
Q. I will ask you whether or not you were ever adjutant general of the national guard of the State of Washington, and, if so, when?
A. I was, from 1895 until the great upheaval of 1896—until the following January, 1897.
Q. And as adjutant general you held the rank of brigadier general in the national guard?
A. In the national guard, yes sir.

Mr. MACDONALD: I desire to state to the counsel for the defendant that a communication was received by Governor McGraw (then governor of the State of Washington) from the sheriff of Pacific County, State of Washington. I know of my own knowledge that this document was received from the sheriff of Pacific County at the governor's office, as at that time I was his private secretary. I do not desire to take the witness stand to identify this document, and I will ask counsel if they will admit its authenticity. I can take the stand and swear that it was received at the governor's office.

Senator FULTON: What you want us to admit is simply that document is the document that was presented by the -iff of Pacific County to the governor of the State of -ton at or about its
214 date?

Mr. MACDONALD: The peculiar feature about that document is that no date is shown on it. It was received in the governor's office about the 7th day of April, 1896.

Attorney General CRAWFORD: This is simply a request by the sheriff of Pacific County for the governor to order the militia to the assistance of the sheriff?

Mr. MACDONALD: Yes.

Attorney General CRAWFORD: I don't know as we have any objection to that.

Mr. MACDONALD: Then, the State of Washington offers in evidence a communication from Thomas Roney, Sheriff of Pacific County, State of Washington, to Hon. John H. McGraw, Governor of the State of Washington, which was received at the Governor's office on or about the 7th day of April, 1896.

The same was marked Washington's Exhibit J, and signed by the Commissioners.

Said Washington's Exhibit J reads as follows:

"To his Excellency Hon. John H. McGraw, Governor of State of Washington:

The undersigned, Sheriff of Pacific County, in the State of Washington, most respectfully represents:

That on Friday, the 3rd day of April, 1896, while about twenty fishermen, citizens of the State of Washington, were lawfully engaged in driving piles to be used in fish traps in the waters of Columbia River at a place called Bakers Bay, in Pacific County, Washington, a large number, to-wit: between two hundred and three hun-
215 dred men most of whom residents of Astoria, Oregon, armed with knives, hatchets and other deadly weapons, came with a steamboat and a large number of fish-boats, to the place where said men were so driving said piling, and forcibly, violently, and unlawfully, by intimidation, threats and actual force and violence, compelled said men who were so lawfully engaged in driving piling, to pull piling from a number of lawful fish traps, which had been lawfully operated prior to the year 1896, and which the owners intended to lawfully operate during the fishing season of 1896; that said men driving piling were working from three steam pile-drivers each of which consists of a boat about 18 feet in width and about 40 feet 6 inches in length with steam pile-driver and gear, and each of which is worth from $1500 to $2000; that said assailants, in large numbers, gathered in fishboats around about said three pile-drivers and in large numbers boarded the same, and by force overcame the men lawfully thereon; that said assailants attempted to and did do great damage to said piledriver boats, and did cut the ropes belonging to the same, and cast overboard the anchors, and otherwise broke, injured and destroyed various parts of said pile-drivers; that said assailants compelled said men to continue to pull said stakes as long as the piledrivers were in a condition to be used, and until the gearing to said piledrivers became broken by reason of rough usage at the hands of said assailants; that after said drivers could be no longer used, by reason of their broken condition, said assailants cut the ropes which held them in place, and set said pile-drivers, three in number, to drift over the Columbia River bar into the ocean, in order to destroy the same; that as two of said drivers were about to go over the bar, a steamer belonging to P. J. McGowan & Sons, caught them, and towed them to a place of safety;
216 that one of said drivers was cast upon the beach of said island at the mouth of Columbia river; that on Monday the 6th day of April, 1896, said driver had not been saved although a large force of men had been at work attempting to get the same off the sand and to a place of safety; that as to whether or not said driver or any part thereof has since been saved the undersigned is uninformed, but it is the opinion of the fishermen of said county that said driver cannot be saved, thereby causing a loss of about $1500

to the owner, who is a citizen of the State; that at said time and place April 3rd, said assailants knocked down, kicked and bruised and otherwise maltreated a number of said citizens of the State, and threatened to hang some of them to the said pile drivers and set them adrift over the bar; that said assailants refused to allow any of said citizens to return to the town of Ilwaco (which was about three miles away) until after said drivers had been set adrift as aforesaid; that at said time and place said assailants informed said citizens that the Fishermen's Union, a powerful organization of the State of Oregon, composed of many hundreds of gill-netters, was supporting them in said depredations, and that it was the intention of said assailants and of said union to prevent, by force and violence, the operation of any fishtraps in Baker Bay during the season of 1896; that they would come over in large numbers and destroy the drivers as often as our citizens attempted to use them, and that they would destroy the web lawfully placed on the trap piling as fast as it was placed thereon; that after said depredations had been committed a number of fish boats, containing a large number of Oregon fishermen, were lying in wait near Sand Island, in Pacific County, to destroy the property of our citizens as they would attempt to complete their traps; that said Oregon gill-netters have threatened to, and the undersigned and the fishermen along Baker's Bay, believe
217 they will destroy and attempt to destroy the fish traps of our citizens in Baker's bay; that on account of the peculiar situation and the character of the defense, the undersigned is unable to adequately or at all properly protect the property of the citizens of said county; that said Oregon gill-netters can, and undoubtedly will, make frequent incursions into the waters of said bay, and to a great extent destroy the fishing industry of the state, unless assistance is immediately rendered by the state; that the fishing season opens on April 10th, 1896, but our fishermen, on account of the violence heretofore committed, and the threats made by said Oregon fishermen, and the inability of said sheriff to render adequate protection, dare not place their webs on the fish trap piling, and dare not expose their property to the violence of said Oregon fishermen; that unless our fishermen are able to operate their traps during the whole season, they will be greatly and irreparably injured; that in Baker's Bay there are about 400 fish traps belonging to citizens and residents of the State of Washington, of the aggregate value of about $40,000; that the value of the pile drivers and the boats used in the construction and operation of said traps is about $50,000; that the approximate value of the fish caught per season is $400,000; that the fishing season is of only four months duration, from April 10th to August 10th; that for each trap a license of $10 is paid to the State of Washington; that great fear prevails not only among the fishermen of said county, but among the cannerymen as well; that the fishing industry, which is the greatest industry of said county, is almost at a standstill, and the fishermen are now idle, whereas, except for the matters above stated, they would be now engaged in placing the web on their traps preparatory to the commencement of fishing on the 10th of April.

Wherefore, by reason of the matters and things herein
218 stated, the undersigned, as sheriff of said county, most respectfully calls upon the Commander-in-Chief for such aid as in his discretion is just, proper and adequate.

THOMAS RONEY,
Sheriff of Pacific County, State of Washington."

Q. I desire to inquire whether or not you know what action, if any, was taken by Governor McGraw after the receipt of that communication.

A. General Carr, Commander of the National Guard at the time, came down with three officers and forty men of the National Guard.

Q. Where was that detachment of the National Guard sent?

A. It was sent to this neighborhood and encamped at Ilwaco; that was the main camp.

Q. You may state whether or not any person of that detachment was station- upon Sand Island, and, if so, for what purpose.

Q. About the time this detachment was sent down, or before this detachment was sent down, a lot of people had come over from Astoria and had done great damage to our fishing traps, and a detachment was placed on Sand Island with the view of keeping them entirely away from Sand Island and to prevent their doing damage to our properties there. There were quite a number of fish traps on the island.

Q. How long did the detachment stay upon Sand Island, if you know?

A. I don't recall, but it was several days.

Q. As I understand, you were sent there for the purpose of guarding the traps which were owned by citizens of this state.

A. Yes sir, protecting our fishing interests on Sand -land.

219 Cross-examination.

By Attorney General CRAWFORD:

Q. That was in the nature of a riot, was it?

A. Yes, it was a strike on the opposite side of the river, and they came over and tried to stop our fishermen from fishing here.

Q. The Oregon authorities took no part in it?

A. No; the Oregon militia was not here. I don't understand that Oregon took any legal part in it at all. It was a strike.

Q. The strike originated on the Washington side?

A. Oh, no, on the other side.

Q. On the Astoria side?

A. Yes.

Redirect examination.

By Mr. MACDONALD:

Q. Do you not recall the fact that a portion of the Washington National Guard was sent to Astoria to do duty there?

A. Yes, about a month later.

Q. But, as far as you know, no portion of the Oregon Guard was sent to protect Sand Island.
A. Not at all.
Q. Or the traps or property thereon.
A. Not at all.

Recross-examination.

By Attorney General CRAWFORD:

Q. You understood at that time that Sand Island was a military reservation, did you not?
A. Beg pardon?
Q. I say, you understood at that time, did you not, that Sand Island was a United States military reservation?
A. No, I didn't so understand, but it developed after our
220 people were placed upon the island that it was claimed as a military reservation by the United States.
Q. How did it develop?
A. Captain Adams, who commanded the detachment here, had a detachment on the island, and the commanding officer, I think, of Fort Canby, reported to the Department Commander the presence of troops there, and I think the Department Commander knew it was a military reservation. I don't know whether the commanding officer here did or did not know it, but the Department Commander did know and directed the commanding officer down here, as I remember, to direct Captain Adams to vacate, to move off the island.
Q. Yes, that is right. What I wish to get at is simply this, that the Washington militia was directed to vacate the island by the United States authorities?
A. Yes sir.
Q. And did so?
A. Yes sir.

By Mr. MACDONALD:

Q. You had a conference with General Otis, commanding the Department of the Columbia, in regard to the matter, did you not?
A. I did, yes.
Q. But nevertheless, the State of Washington claimed jurisdiction over Sand Island, did it not?

Senator FULTON: That is objected to as leading, suggestive and incompetent.

A. It is a pretty hard question for me to answer, it is so long time ago. I know that we had traps there. I know that our State Fish Commissioner assumed that it was state property, inasmuch as he collected taxes from the trap people about there. I assume that he believed it to be Washington territory.

221 E. W. Ross being duly sworn as a witness on behalf of the complainant, testified as follows:

Direct examination.

By Mr. MACDONALD:

Q. Mr. Ross, please state your name.

A. E. W. Ross.

Q. What official position, if any, do you hold in the State of Washington?

A. Commissioner of Public Lands.

Q. And you have held that office since the middle of January, 1905?

A. Yes sir.

Q. And your terms expires in January, 1909?

A. Yes.

Q. And you are the acting and qualified Commissioner of Public Lands at the present time?

A. I am.

Q. You may state what jurisdiction, if any, your office entertains over the public lands, tide lands, etc., of the State of Washington.

A. All of the landed interests of the State, including all State-granted lands, tidelands, oyster lands, whether attached to the main land or detached.

Q. I will ask you if you have in your possession a map or drawing showing the sands or islands in the Columbia river which are claimed by the State of Washington as its property?

A. I have a map, not showing, however, all of the sands and islands claimed by the State of Washington in the Columbia river, but showing such sands or lands as are claimed by the State of Washington insofar as the State has sold or disposed other-

222 wise of those lands.

Q. I should be glad to have you exhibit that map or drawing and explain it in detail.

A. (Producing map.) In this map no attempt is made to show the Oregon shore line at all. The attempt is made to show merely such sands and portions of sands and islands, detached tidelands, etc., as the State of Washington has sold or contracted to sell to private individuals, and lands for the purchase of which applications are now on file in my office pending action. The parts or what appear to be islands marked, for instance, "Contract" are tracts where the State has issued a contract agreeing to execute a deed or patent when the final payment of principal and interest has been made; others are marked "Deed," indicating that full payment has been made and deed or patent has been issued by the State. The patches of ground included within the apparent boundaries or limits of these conveyances are not intended to show the entire body of land that might be sold or occupied for one purpose or another in the locality, but merely such portions, for instance, as that shown as the Desdemona Sands,—merely such portion as the State has sold. We still claim

the balance, the remainder of the Desdemona Sands, although we have not sold except the portion indicated in this map. Such would be the case also in reference to Sand Island. A number of applications have been made to the State of Washington for the appraisement and sale of those lands, but it is not claimed that this map shows all of Sand Island; merely the portions that have been surveyed and for which applications are pending. This is true all along the river.

Q. Then, I understand that the State of Washington claims all of Sand Island?

Senator FULTON: We want to object to that. The witness
223 is not authorized to speak for what the State of Washington claims. The testimony in that respect is incompetent.

Mr. MACDONALD: Do you claim, Senator Fulton, that this testimony should be brought from the governor of the state, rather than the officer charged with the administration of public lands?

Senator FULTON: I make no claim of that kind. I simply contend that no official can speak for what a state claims. What a state claims can possibly be evidenced by what she has done, but beyond what her acts show no officer is authorized to speak.

A. Yes, the State of Washington claims all of Sand Island, and at the present time we are contending for all of Sand Island notwithstanding the claim by the War Department that the present Sand Island is a military reservation.

Q. I desire to call your attention to two lines upon this map which are called "Government jetty," and I will ask you whether or not that is intended to show the same government jetty which appears on Washington's Exhibit I, the two lines of which meet at an obtuse angle on Snag Island?

A. I have examined that. I understand it does; it is intended to show the same jetty.

Q. I desire to inquire, Mr. Ross, whether or not your map here shows the dates of these deeds or leases or contracts.

A. The map does not show the dates of the deeds or of the contracts. In all cases where a tract of ground represented on that map is marked "Contract" a contract of sale has been issued and is now in good standing; that is, the installments of principal and interest provided for in the contract and which are due have been
224 paid and they are in good standing, and in all cases marked "deed" the patent of the state has been issued.

Q. Can you state, generally speaking, when the state first claimed to own these lands or islands in the river there, as shown by the execution of contracts, leases or deeds?

A. I could not name a specific date, but from the examination I have made of the records, I should say very shortly after the admission of the State into the Union.

Q. You have been familiar with the history of the State since its admission into the Union, have you?

A. Personally since June, 1891.

Q. And for four years preceding your induction into the office

of Commissioner of Public Lands, you were assistant attorney-general of the State of Washington?

A. I was assistant attorney general of the State of Washinton, yes sir.

Mr. MACDONALD: We desire to offer in evidence this drawing concerning which Mr. Ross has just been testifying and ask to have it marked as an exhibit.

The same was marked Washington's Exhibit K, and signed by the Commissioners.

Q. Mr. Ross, I desire to hand you a copy of the bill of complaint in this case, as filed in the Supreme Court of the United States, and invite your attention to a map which appears therein upon which you will observe a black line marked "boundary line."

A. Yes.

Q. I will ask you to state with reference to that line what sands and islands are claimed to be owned by the State of Washington.

225 Senator FULTON: The State of Oregon objects to that for the reason it is incompetent.

A. I have examined this map before, and can only say that the State of Washington claims all of the sands and islands north of that line. In addition to that, I think there are places where the State of Washington has exercised jurisdiction and actually sold the lands south of this line.

Q. Is there any other matter, in your knowledge, material to this controversy, concerning which I have not interrogated you? If so, I should be glad to have you make a statement.

A. I don't recall anything at this time.

Cross-examination.

By Attorney General CRAWFORD:

Q. At the present time you are Land Commissioner of the State of Washington, are you?

A. Yes sir. Commissioner of Public Lands is the statutory title of the office.

Q. How long have you been such Commissioner?

A. Since the 11th day of January, 1905.

Q. At the time you were appointed or elected Commissioner, had the State of Washington issued any contracts to any persons whomsoever for any portion of Sand Island?

A. I think no contracts have actually been issued for any portion of Sand Island as at present delineated on the maps.

Q. There was simply an application made by some parties to buy it, was there not?

A. Application made in the same manner as applications were made in all of these other cases where we had sold.

Q. And protests against the sale of that were filed in your office by the citizens of the State of Oregon, were there not?

226 A. I think not.

Q. Such protests being made to your Land Department?

A. I don't know of any such protests personally. Protests are filed as between applicants. There are some contests as between applicants, each of them claiming prior rights, as I remember it, but no protest by the State of Oregon or citizens of the State of Oregon, on the ground that it is not Washington territory, have come under my observation.

Q. And no money has actually been paid and accepted as part payment on any contract for any portion of Sand Island by your State or by your Department?

A. Yes; with each applicant there is a sum of money deposited which will apply on the purchase price if a contract or deed is finally issued.

Q. That is simply held up for the present, is it not?

A. Yes.

Q. And that money has been paid and those applications have been made since you took charge of the office?

A. No, I think not. I think several of them were pending when I took charge of the office.

Q. Well, they have all been made in the last two or three years, have they not?

A. I think so.

Q. Can you furnish me data of all the contracts which are shown on Washington's Exhibit K for lands contracted or conveyed or attempted to be conveyed by the State of Washington which are lying in the Columbia river?

A. Yes, I could do so, but I hope you won't ask for it, because it is an enormous job, and we are very busy.

Q. I would not care particularly for the acreage or anything of that nature, but simply the date of the conveyance and to whom conveyed.

227 A. You have the names on that map.

Q. And the date?

A. The date is not on the map. This map was made from the official map kept in the Engineer's Department of my office. In order to furnish the date I would have to go to each original and separate application and contract or deed that was issued, in another department, and it would require a lot of time and I did not have the time to spare to look that up so as to put it on this map. If you really desire it, I will undertake to furnish it, whatever the cost.

By Senator FULTON:

Q. When was the application made to the State of Washington for the purchase of the Desdemona Sands, and by whom?

A. I could not tell you that. It was before my incumbency of the office, as I remember it. I could not tell you the date from memory.

Mr. MACDONALD: You can state from this map by whom it was made, can you not?

WITNESS: Yes, the name shown there is correct. It is B. F. Houston.

Q. There has been no sale of it, though?

A. Yes, sale, and contract issued.

Q. Just simply a contract?

A. Yes, the contract acknowledged receipt of a certain portion of the purchase price, and provides that if another fixed sum is paid in installments a deed will be issued.

Q. That is your recollection of the contract?

A. I have signed it.

Q. Have you seen that particular contract?

A. I have not read that particular contract, but they are all alike.

Q. You assume they are?

228 A. Yes.

Q. You have not seen that particular contract?

A. Not that particular contract.

Q. Now, as a matter of fact, don't you know there was a protest filed against the sale of that by the State of Washington on the ground that it was without the jurisdiction of Washington?

A. I do not know.

Q. You know nothing about that?

A. That protest would be in the general files, not with the contract, according to the system of keeping records in my office, and not with the maps in the Engineer's office. Unless there was something that would require me to go to the original files and to read the original record that was made before the issuance of the contract, I never would do it.

Q. You do not know, then, whether the State of Oregon did file a protest or whether anyone on its behalf did file a protest?

A. I could not say.

Q. And you do not know whether or not there was any money paid on account of that contract as a matter of fact?

A. Well, personally I did not receive the money. Of course, I know the contract would not be extant without the money.

Q. That is, you think it would not properly be?

A. I am perfectly satisfied that would be impossible.

Q. Well, you are simply inferring that? That is, your judgment is that such would be the case?

A. Yes.

Q. You know nothing about the facts?

A. Only as I find them a matter of record.

Q. Well, have you found anything in regard to that as a

229 matter of record?

A. I find that the contract outstanding is in good standing —what we call good standing.

Q. Have you seen the contract?

A. No, but I have seen my records.

Q. What records?

A. The maps in the engineer's office.

Q. The map of which this is a copy?

A. Yes. No, it is not a copy. The scale of this is very materially reduced. Also, I send out annual notices that certain installments of principal and interest will become due and must be paid within a certain time, and these cases are checked up, and they are among

the cases where notices are sent out in that way, so that the contract is of record as a contract.

Q. Do you remember particularly this contract of the Desdemona Sands?

A. I would not say that I could single that out from any others on this map.

Q. You don't remember for how much it was sold?

A. No.

Q. Or contracted to be sold?

A. No, I couldn't say, Senator. I could tell you it would be $5 an acre under the law; I know that.

Q. You don't remember of your own knowledge what amount has been paid on it, if any?

A. I couldn't say, no.

Q. Don't you know as a matter of fact that that contract was simply made with Mr. Houston for the prupose of raising the question as to whether or not the jurisdiction of Washington extended to these sands?

230 A. Well, Senator, I could not conceive of a public official entering into a contract for that purpose. I have no such knowledge.

Q. If you have no such knowledge, say so; don't make an argument. I ask you simply if you have any knowledge of that.

A. I never have received an intimation of anything of the sort.

Q. On how long a term are these sold?

A. One-tenth prior to the issuance of the contract, and the remainder in nine equal installments, at six per cent. interest.

Q. Do you know as a matter of fact that the State of Oregon has sold these same lands, many of them?

A. I do not.

Q. Is it not your understanding that the State of Oregon has sold many of these same lands?

A. I have been told that the State of Oregon has sold many of the same lands.

Q. You understand that the State of Oregon sold the Desdemona Sands, for instance, many years ago, do you not?

A. I heard that at Astoria, on my way here, Senator, but I did not know it before.

Q. You had never heard anything about it before?

A. No, I had not.

By Mr. MACDONALD:

Q. You may state whether or not, Mr. Ross, our laws provide a minimum price for the sale of lands of this character.

A. Yes, the law fixes a minimum price of $5 per acre.

Excused.

231 DANIEL MARKHAM being duly sworn as a witness on behalf of the complainant, testified as follows:

Direct examination,

By Mr. MACDONALD:

Q. Mr. Markham, will you be good enough to state your name, residence and business.

A. Dan. Markham is my name; residence Ilwaco; and my occupation, fisherman.

Q. I desire to inquire of you, Mr. Markham, how long you have resided in Ilwaco.

A. Since the fall of 1879.

Q. Has your residence in Ilwaco been continuous since that time?

A. Yes sir.

Q. I will ask you whether or not you have been familiar with the channels used by ocean-going steamers and vessels in going to the upper river since your residence in Ilwaco.

A. Yes; I have been over them the year round almost.

Q. I will ask you whether or not you have been familiar with the location of Sand Island since your residence in Ilwaco.

A. Yes.

Q. You may state whether or not Sand Island has moved since you first knew it in 1879, and, if so, in what direction.

A. Well sir, Sand Island as it was in 1879, when I came here, has gone to the north and west.

Q. You are familiar with the location of Sand Island as it exists at the present time, are you, Mr. Markham?

A. Well, yes, I know how it is situated; I have been on it frequently.

Q. I desire now to inquire of you whether or not, since you have lived in Ilwaco, ocean-going vessels or steamers have used the

232 channel or course in coming into the river from the ocean which would carry them north of where Sand Island now exists?

A. No sir.

Q. I will ask you whether or not you are familiar with the channel at the nearest points between Cape Disappointment and Sand Island at the present time? That would be right here. (Pointing on Washington's Exhibit H).

A. Well, I have been over there frequently.

Q. You may state whether or not vessels at this time use a course which would carry them through the water between Cape Disappointment and the nearest point of Sand Island due east.

A. Due east?

Q. Yes.

A. Going from Fort Canby due east?

Q. Yes.

A. That would run you right through the island.

Q. I don't mean that, Mr. Markham; I mean taking these two points between Fort Canby and the nearest point on Sand Island

whether or not a vessel could pass through a channel going north between these two points.

A. No sir.

Q. What is the character of that water in there as to being shallow or otherwise?

A. Oh, it is very shallow now.

Q. About how shallow is it?

A. In an extreme low run out from the Fort, a little, rather, from Peacock Spit across to Sand Island, I think in the last big tide we had I could wade right across; I could wade from Chinook Beach clear to Fort Canby.

Q. What was the character of the water or the channel north of Sand Island and which is used by steamers going from Ilwaco to Astoria?

233 A. At the present time?

Q. Yes.

A. It is very shallow. A steamer of any draught, such as the regular steamer, the Nahcotta, and the Potter, has got to wait till towards high water.

Q. Do you know what the draught of the Potter and Nahcotta is, how much water they draw?

A. I don't know exactly; I think with a load on something like ten feet.

Q. I desire to inquire whether or not since your residence in Ilwaco ocean-going vessels or steamers have come into the Ilwaco dock.

A. Not to the dock.

Q. How far into Baker's Bay have they come?

A. Well, along in 1880, 1881, and 1882, vessels came in the north channel, that is, barques and schooners, and the steamers running to San Francisco came in there occasionally too, but I have no recollection of any ocean-going vessels coming in later than 1882.

Q. Now, are you aware of the channel used at the present time by ocean-going steamers and vessels in going to Astoria and up the river?

A. Well, I see them go every day, that is, in the south channel.

Q. Where is that channel with reference to Sand Island?

A. It is south of Sand Island.

Q. Could you approximate the distance?

A. That the vessels go up?

A. No, of the ship channel going from the ocean to Astoria and the upper river.

A. It is hard to tell just exacly the distance; I don't know
234 how wide the channel is, that is, the exact measurement, and water is deceiving. Without any measurement, I should judge it was, from looking at it, standing on the south side of Sand Island and seeing the steamers go up, three-quarters of a mile, something like that—over half a mile.

Q. You may state whether or not you have ever known ocean-going steamers or vessels, in going to the upper river, to follow

a course which would carry them close along the Washington shore past Point Ellice.

A. Well, now, I am not so well posted after you get above along Point Ellice, up there; I have no occasion to ever be there, only as I go up the river on a steamer, that is about all. I couldn't give any evidence that would be worth anything as to up there.

Q. In conversation with you, this morning, you spoke about a wreck having occurred some years ago. I have now forgotten the name of the steamer. Will you kindly tell us about that?

A. On the 10th day of March, 1880, the British barque "Deharrie," loaded with wheat, in going out, got rather close to the entrance of the north channel, that is, below Fort Canby, and struck Peacock Spit right close to her starboard at that time, and swung off into the channel and worked off and across the channel and struck all the way across. The tugs couldn't get her away, and when she struck the heavier sands on the west point of Sand Island she stuck there and went to pieces.

Q. How far was that wreck from the most southerly point of the headland known as Cape Disappointment?

A. I couldn't give you the distance, but it was a long ways farther than it is now; it must have been 2 miles.

235 Q. Two miles from Cape Disappointment?

A. Very nearly. I believe it was a mile and a half, anyway. I was driving traps in 1893, when Mr. Hegardt surveyed the ground in the channel there; the stakes stand there now away east on the highest part of Sand Island where there was good fishing ground in 1893, and they are all up now on high ground and there is only one line of traps left down on the west end of Sand Island where there used to be four or five.

Q. Has the north channel been used since the wreck of the "Deharrie"?

A. That was in 1880; as I said before, in 1882 I think they ceased to use it. Oh, occasionally the tugs would go out later than that, but as to any ships or anything of that kind being towed in, I have no recollection of later than 1882. I fished a gill-net up through 1882. After that I had a point net right close to Fort Canby, out from the government reservation, right above the dock, and I have no recollection of any ships laying to anchor there later than that. Tugs would come in there and go around the north channel and go out the north channel, but as far as loaded ships coming in the north channel, it was very dangerous even in the spring of 1880. The "Deharrie" proved that.

Cross-examination.

By Senator FULTON:

Q. When did they first commence driving traps in Baker's Bay?

A. Well, sir, I drove a trap in the spring of 1880, but did not fish it very long.

Q. That was the first trap, was it, driven in the bay?

A. No; "Dutch" Charley had one in 1879, a little west, above; perhaps three-quarters of a mile above.

236 Q. Why did you not fish it long?

A. At the time we had no gear and we didn't understand putting it in.

Q. Since then, there have been a great many traps driven there?

A. Yes, sir.

Q. Now, will you describe how these traps are constructed?

A. Well, it is just simply a small pile driven; then there is a lead drove, and a system of hearts and pounds.

Q. The piling is driven in a line of considerable length is it not?

A. They run all the way from 200 feet to 800 feet, which is the limit under the law.

Q. The length of the line covered by the piling?

A. Yes.

Q. What is the distance between the piles?

A. That varies all the way from 12 feet to 20 feet.

Q. How many such traps are there today in Baker's Bay?

A. You mean from McGowan's?

Q. Well, take a line running from the most northern point of Cape Disappointment to Chinook Point?

A. The most northern point?

Q. Yes.

A. That would cut some of the traps out.

Q. About how many?

A. Why I couldn't state the exact number, but I think at one time from McGowan's down all over Baker's Bay and the island, that there were over 400 at one time; I don't think there are over 275 now, if there are that many. I wouldn't be positive.

Q. Where some of them have been driven, the ground has shoaled so that they became useless?

A. Oh, yes; lots of them were on the highest part of Sand Island, as I stated before.

237 Q. What proportion of them would be within the line I have suggested, that is, between that line and the Washington shore?

A. Oh, perhaps——

Q. 95 per cent. of them?

A. No, there wouldn't be that many; there would be two-thirds anyway.

Q. These traps have caused the shoaling of that bay very largely, have they not?

A. Well, that is a question. There are some traps, where the sands have never had occasion to drift any, that haven't shoaled any, but as the jetty goes out the island has come up, seemingly, and the sands have gathered in there and filled it in.

Q. It is rather a complicated proposition to navigate that bay and miss all the traps, isn't it, at the present time?

A. Well, since the channel line has been laid out, there has been no trouble.

Q. But there was before?

A. Yes; there had to be a check put to it, and we petitioned the Department to have it done, and the Engineer Department in Portland ordered Mr. Hegardt there, and it was through the men themselves we had a line established and the channel laid out. Since then, there has been no particular trouble in navigation.

Excused.

238 L. D. WILLIAMS being duly sworn as a witness on behalf of the complainant, testified as follows:

Direct examination.

By Mr. MACDONALD:

Q. Mr. Williams, where do you reside?

A. Ilwaco.

Q. What is your business?

A. In the grocery business at present.

Q. You have resided in Ilwaco continuously, you say, for 30 years?

A. Yes, sir.

Q. I will ask you if you are familar with the courses pursued by ocean-going steamers and vessels in going up the Columbia river since your residence in Ilwaco?

A. Yes, I can say that I observe them every day from the house.

Q. I will ask you to state what course vessels pursued in going to the upper river when you first came to Ilwaco?

A. Well, they went some in both channels, what was known as the north channel and the south channel, although I should say that there were more going in the south channel, what we call the south channel now and was the south channel then. But a few vessels along in 1880 and 1881, or so, (I wouldn't be positive exactly about the exact dates, but in those years), used to come in what is known as the north channel and anchor in Baker's Bay between Ilwaco and Fort Canby.

Q. Taking those vessels now that anchored, as you have just stated, between Ilwaco and Fort Canby, after pulling up their anchor, which course would they then pursue in going up the river?

A. They went up on the north side of Sand Island.

239 Q. Now, when you speak of the north side of Sand Island, do you mean Sand Island as it exists at the present time?

A. Well, Sand Island has made north so much that it would be pretty hard for me to define the exact channel then as it is now.

Q. Let me ask you this. Taking the course which you have just described as having been pursued by these steamers, would that carry them north of the most central part of Sand Island as it now exists? Just let me call your attention here to Washington's Exhibit H. You see here the most northerly part of Sand Island; down here is Fort Canby; Ilwaco up there.

Now, what I desire to inquire is this; whether or not vessels, coming in from the ocean, would pursue a course practically desig-

nated by this blue line which goes, as you observe, north of Sand Island. Was that course pursued by vessels, as far north as that?

A. You mean that black line?

Q. No, the blue line.

A. Well, it would be pretty hard to determine, of course, the course of the channel, but I think, though, that the island has made more or less all along the north side of it, but mostly on the west as well as the north; it has builded to the north. In those days I believe that vessels would be a little more south than it is now.

Q. Sand Island has been constantly moving north since you have lived in Ilwaco?

A. Yes.

Q. Now you may state, if you know, whether or not vessels are at the present time using this north channel, as you have called it, in coming from the ocean to Astoria and points farther up the river, such as Portland.

240 A. No sir.

Q. How long is it since ocean-going steamers have abandoned the use of the north channel?

A. I have no recollection of any of them coming in since 1881 or 1882 at the latest.

Q. What channel is now used by these ocean-going vessels in coming from the ocean to Astoria and the upper river?

A. Why, what is termed as the south channel—the only channel.

Q. Are you familiar with the channel at the present time north of Sand Island, between Ilwaco and Astoria?

A. Yes, some.

Q. Do you know what the depth of that channel at its shoalest point is, at low water?

A. At one certain place at the east end of the island, I don't believe there is more than a foot or two at extreme low water.

Q. And is that shoal water that you mentioned in the channel?

A. Yes sir.

Q. Now, are you familiar with the depth of the water east of Fort Canby, we will say, to Sand Island—this stretch of water here between Fort Canby and Sand Island? (Pointing on map.)

A. The west end of Sand Island?

Q. Yes.

A. Yes sir. I couldn't say the exact depth of it. At the west end of the island I don't know what the depth of the water is, but it is not very shallow, of course. There is what they call the cut-off, a little sink, leading from the Point to Fort Canby, leading

241 in a southeasterly direction, until it intersects the south channel.

Q. Is that channel at the present time of sufficient depth to admit of the passage of ocean-going steamers and vessels at low water?

A. Through this cut-off?

Q. Yes.

A. No sir.

Cross-examination.

By Attorney General CRAWFORD:

Q. Where did you say that this was only a foot or two deep—this channel?

A. At the east end of Sand Island, that is, at nearly the east end of it, at the north side of Sand Island.

Q. As it is now constituted?

A. Yes sir. The Nahcotta can only come to Ilwaco at nearly high water; it can pass possibly on two-thirds tide.

Q. And the Potter also comes through the same places, does it not?

A. Yes. They call it the "hill." They have to wait until the tide comes up so that they can get over the hill.

Q. And the Potter is a steamer plying between Portland and Astoria, regularly, is she not?

A. I believe it does a good deal of the time; not all of the time, though.

Q. She is the largest river steamer plying on the river, is she not?

A. Of the side-wheelers, I guess she is, but not the largest steamer.

Q. What steamer is larger and carries more passengers or freight than the Potter?

A. Well, between Astoria and Portland, I believe that the Potter can carry the largest number of passengers, but there are larger steamers, drawing more water, than the Potter.

242 Q. What one?

A. Well, we will take ocean-going steamers; they travel between Portland and Astoria.

Q. I confined the question to river steamers.

A. I couldn't say which steamer draws the most water; that would be impossible for me. I don't know what water exactly the Potter draws. It is not the largest steamer sometimes that draws the most water.

Q. Do you know of any steamer plying on the river drawing more water than the Potter?

A. No I do not for I don't know what the Potter draws.

Q. You may state, if you know, what is the rise and fall in the tide at the north side of Sand Island where you say this low water occurs.

A. Well, we call it the medium, that is, the average rise and fall, about 8 feet.

Q. You may state, if you know, how far this low water exists or what is the width of the "hill," as you call it.

A. I couldn't say as to the exact measurement, but the steamer Nahcotta now in going to Astoria, when water is not of sufficient depth, goes under a slow bell for possibly——

Q. That was not the question. I just said you might state, if you know, the width of the "hill"; if you don't know, why, that is all.

A. I don't know the width of it; I never measured it.
Q. It is narrow, is it not?
A. Oh, possibly the width of it would be two or three hundred feet in some places; in some other places it would be wider.
Q. That is the lowest place in the channel of which you have any knowledge, isn't it?
A. Yes sir.

Excused.

243 W. D. WHEALDON being duly sworn as a witness on behalf of the complainant, testified as follows:

Direct examination.

By Mr. MACDONALD:

Q. Where do you reside, Mr. Whealdon?
A. Ilwaco.
Q. How long have you resided at Ilwaco?
A. 46 years.
Q. Has your residence at Ilwaco been continuous for 46 years?
A. No, but it has been almost continuous.
Q. You are at present a resident of Ilwaco?
A. Yes sir.
Q. I desire to inquire of you whether or not you are familiar with the courses of the channels used by ocean-going steamers in coming from the ocean into the Columbia river.
A. Well, my familiarity with the channel is just such as a ranger sitting back on a hill would have, looking down over it. I could see every vessel that came in and could see the channel and the island and all that.
Q. When you first came to reside at Ilwaco, I understand there were then two channels from the ocean into the river?
A. Yes, there were.
Q. Which channel was customarily and usually used by these steamers and vessels coming from the ocean, the north channel or the south channel?
A. My recollections are that both channels were used, both the north channel and the south channel. I think there were more vessels came in the south channel than the north.

244 Q. How long did that condition of affairs continue to exist, as far as you are able to state?

A. Now you have got me. When you get me down to dates, I don't know anything about it. Oh, perhaps 20 years.
Q. You may state whether or not vessels are now using the north channel.
A. They are not.
Q. Do they use a channel which would carry them north of Sand Island at the present time?
A. They do not.
Q. What channel do they use?

A. They use what was originally called the south channel, as it appears to me.

Q. Now, you are familiar with Sand Island and its present location?

A. Yes, in the way I speak of. I see it every day as though it was spread out on a map.

Q. Were you familiar with the location of Sand Island 46 years ago when you first came to Ilwaco?

A. Yes.

Q. Where was it then with reference to its present location?

A. Sand Island, as I recollect it, was not nearly so large as it is now; it wasn't so long. The east end of it was probably about near where it is now, but it didn't extend nearly so far west, and it was farther south than it is at present.

Q. That island has been constantly moving north and west, and increasing in area since that time?

A. I can't say whether it has been constantly moving or not, but during that time it has moved very much farther to the north.

Q. And to the west as you have just described?

A. Yes sir; very much to the west.

245 Q. Referring now to Washington's Exhibit H, are you familiar with this little stretch of water between Fort Canby and the nearest point due east on Sand Island?

A. That is that little stretch of water right in there, from Fort Canby? (Pointing on map.)

Q. Yes sir.

A. Well, I have that familiarity with it that I speak of.

Q. Then, do you know whether or not vessels coming from the ocean go up that stretch of water between Fort Canby and the island into Baker's Bay, at the present time?

A. Certainly they do not.

Q. They do not?

A. No sir.

Q. Are you familiar with the location of Johnson's house, that white house which is mentioned in the sailing directions upon the map, of the hydrography of 1854, which has been introduced in evidence?

A. I am very familiar with a house which at one time belonged to Captain Johnson. I lived in it for 40 years. I have heard the pilots say that they used it as a sight when they were coming in over the bar.

Q. Now, could you show me on this map Washington's Exhibit H, the location of that house?

A. Why, I think I can. I can't see well enough, perhaps. It would puzzle me a little. I should judge that it would be somewhere along here. (Indicating.)

Q. That is, at a point just about where the letter "A" appears and the words "Leading In Cliff?"

A. Yes. I don't pretend to accuracy in such a point.

Q. Just above the printed word "Ilwaco" in Washington's Exhibit H?

A. Yes.

246 Cross-examination.

By Attorney General CRAWFORD:

Q. What is your age, Mr. Whealdon?
A. 61.
Q. You were, then, 15 years of age, when you came to the state?
A. Yes.
Q. You are a resident of Washington now?
A. Yes.
Q. Sand Island for a great many years has been growing larger, has it not, on the north and west sides or ends?
A. Yes sir.
Q. And growing a great deal faster on those sides than it has diminished on the others?
A. I know very little about the other side, the south side of the island.

Excused.

G. B. HEGARDT recalled for further cross-examination, testified as follows:

By Senator FULTON:

Q. You recall the wreck of the "Republic," do you not?
A. I was not here at that time.
Q. Well, perhaps you know from common knowledge the year in which she was wrecked?
A. I heard it testified to here several times. It was admitted that the "Republic" was wrecked in 1879.
Q. You have seen the wreck of the "Republic," have you not?
A. Yes, I have seen it a number of times.
Q. Still standing there?
A. Yes
Q. Where does that stand with reference to Sand Island to-day? What part of the island is it?
247 A. It is on the most southerly point of Sand Island.
Q. The timbers of that are still exposed at low tide, are they not?
A. They were within very recent years.
Q. The last time you had occasion to notice.
A. Yes. I know that the fishermen would not fish there, in that vicinity, in the last few years, because the fishing tackle would get caught in the wreck of the "Republic."
Q. When did you quit work at Fort Stevens?
A. A year ago last June.
Q. At that time you could see the wreck from Fort Stevens?
A. I don't think I have seen it for the last two or three years; but I understand some fishermen tried to blast it away during the last year or the previous year. I know it was there three years ago.

Excused.

T. R. KERSHAW sworn as a witness on behalf of the complainant, testified as follows:

Direct examination.

By Mr. MACDONALD:

Q. Mr. Kershaw, what is your residence?
A. Bellingham, Washington.
Q. You were Fish Commissioner of the State of Washington for some four years, were you not?
A. From March 3, 1902, to April 1, 1906,—a little over four years.
Q. I will ask you whether or not as State Fish Commissioner, it was your duty to issue licenses to fishermen and others for fishing rights in the waters of the State of Washington.
A. Yes sir.
248 Q. I will ask you whether or not you are acquainted with the Sands and Islands in the Columbia River?
A. Yes sir.
Q. You may state what, if any, licenses to fishermen and for fishing rights were issued by the State Fish Commissioner to sands and islands in the Columbia river during your incumbency of that office.
Q. Do you want me to name the islands?
Q. Yes sir.
A. We issued licenses to fishermen on Miller's Sands, Oliver Sands, Hog Back, Desdemona Sands, and Sand Island.
Q. Those are practically all of the sands and islands used for fishing purposes north of the boundary line as claimed by the State of Washington, as shown in the bill of complaint in this action?
—. ——.
Q. You may state whether or not official records were kept by your predecessors in office of the issuance of fishing licenses in the same territory.
A. Yes sir.
Q. And you may state whether or not those records came into your possession when you were inducted into the office of Fish Commissioner.
A. Yes sir, records came into my possession. However, I think that there is a year or part of a year that is missing somewhere.
Q. You may state whether or not the records as kept by your predecessors in office showed the issuance of fishing licenses covering the same islands and sands which you have mentioned.
A. Yes sir.

249 Cross-examination.

By Attorney General CRAWFORD:

Q. When did your term of office close, Mr. Kershaw?
A. April 1, 1906.
Q. You may state whether you and the Fish Commissioner for Oregon during the season of 1905 made any arrangements as to

who should collect for or issue fish licenses for certain grounds, and if so, state what it was.

A. The legislature of Washington made an appropriation for defining the boundary line between the State of Oregon and the State of Washington. Mr. Van Dusen came to me—or, by the way, previous to this, also, the legislature of Washington materially increased the licenses of the fishermen, practically doubled it. Mr. Van Dusen, the State Fish Commissioner of Oregon, came to me and said: "Mr. Kershaw, we have been in the habit of getting some licenses from some of these islands, and notwithstanding they have taken out licenses from the State of Washington; it is a great hardship upon the fishermen to pay a double license, and," he says "can't you make an agreement with me until this question is settled, you to collect from certain islands and we will collect from certain islands?" After discussing the matter and going over it with Mr. Van Dusen, I told him that during the present season I would not attempt to collect any licenses from Miller's Sands and the Hog's Back: Those are two fishing grounds up the river.

Q. Did you issue any licenses in 1906 for fishermen on Desdemona Sands?

A. I think so; all of them.

Q. What kind of licenses?

A. Seining licenses.

Q. None others?

250 A. Well, there were none others that we could definitely locate unless they would be traps; couldn't even trap. If a person makes an application to the Fish Commissioner of the State of Washington, accompanied by the proper affidavit, and the fees, a license is issued which reads to fish in any of the waters of the State of Washington. The application for seines describes the ground upon which they wished to seine, the location. We have had applications for licenses the last year both on Hog's Back and Miller's Sands, but I refused to issue them under the agreement that I had with Mr. *Mr.* Van Dusen of the Oregon Fish Commission.

By Senator FULTON:

Q. Were not the rates in Washington lower than in Oregon for licenses generally?

A. No sir, the rates are identically the same.

Q. What is that?

A. They are the same.

Q. Since when?

A. They have been practically always the same, except the fisherman's individual license of a dollar was not enforced in Oregon and it was for awhile in Washington, but the seine and fishing licenses have always been the same since I have been in office.

Redirect examination.

By Mr. MACDONALD:

Q. When a license is issued for a trap, does that designate the territory where the trap should be maintained?

A. The law says that the application shall state as nearly as possible the location; however, the license reads that it may be driven in any of the waters of the State of Washington.

Q. The trap license says it may be driven in any of the waters?

251 A. Yes, but the law says the application shall state as near as possible where it is to be located.

Q. Relative to this agreement between you and Mr. Van Dusen, was that agreement made in pursuance of any statutory enactment of the State of Washington?

A. No sir.

Q. At the time you made this agreement, you may state whether or not it was a fact that the present suit was in course of preparation?

A. Yes sir.

Q. And the legislature had, previous to that time, authorized the bringing of this suit, and had appropriated money for that purpose?

A. Yes sir.

Q. And Mr. Van Dusen was aware of these facts at that particular time?

A. Yes sir.

Excused.

The hearing thereupon adjourned until the morning of Wednesday, July 18, 1906, at 10 o'clock.

252 THE BREAKERS, PACIFIC COUNTY,
WASHINGTON, *July* 18, 1906.

The taking of testimony was resumed before the Commissioners at 10 A. M. at the above place and date, both parties being represented by counsel.

EDMUND JUSSEN being duly sworn as a witness on behalf of the complainant, testified as follows:

Direct examination.

By Mr. MACDONALD:

Q. Mr. Jussen, where do you reside?

A. Spokane, Washington.

Q. What is your profession?

A. Mining and civil engineer.

Q. How long have you been engaged in the practice of your profession?

A. Since 1890.

Q. I wish you would state what colleges or universities you have attended and graduated from.

A. I attended the Austrian School of Mines, at Loeben, Austria; the Saxon School of Mines, at Freiberg, Saxony; the University of

Austria, at Vienna, Austria; and the University of Switzerland, at Zurich, Switzerland.

Q. Where were you born?

A. I was born in Chicago, Illinois.

Q. I wish you would state in a general way what experience you have had since graduation in the active prosecution of your profession.

A. On graduating at Zurich, Switzerland, I was employed by the U. S. Geological Survey for the purpose of making an examination into the old shore lines of Lake Iroquis, a glacial lake, which occupied the present basin of Lake Ontario. In that connection I made detailed studies of all such modern river features and
253 such shore-line features as would assist me in properly determining the old lines of the shore of this Glacial Lake.

Q. You may state what other, if any, employment you had with the United States Government.

A. After that I went to Florida, but my work there for the Government was more of a geologic nature than of a hydrographic nature.

Q. You may state what, if any, other experience you have had along hydrographic lines.

A. Since leaving the United States government employ, I have had a great deal of professional experience in the gauging of streams for the purpose of determining their availibility for water power and other purposes.

Q. Have you had any other experience along hydrographic lines to which I have not directed your attention?

A. I have had considerable experience in actual hydraulics, in the operation of placer mines and the installation of placer mining plants.

Q. And you have been continuously engaged in your profession since graduation, I understood you to say?

A. Yes sir.

Q. Now, you have been retained by the State of Washington for about a year, have you not, as consulting engineer in this case?

A. Yes sir.

Q. You may state whether or not during that time you have studied and read the various maps, publications and reports issued by the government concerning the entrance or lower portion of the Columbia River.

A. Since being employed by the State of Washington in the capacity of consulting engineer I have entered into the ex-
254 amination of all of the records available pertaining to that portion of the river lying between Three Tree Point and the mouth of the river.

Q. I will inquire of you whether or not you have carefully examined all of the maps which have been introduced in evidence in this case and read all of the reports which have been introduced? I mean the reports published by the government.

A. I have.

Q. You may state whether or not you are familiar with the contents of them all.

A. I am.

Q. I desire first to direct your attention, Mr. Jussen, to Washington's Exhibit H. You heard the testimony of Engineer Hegardt concerning the preparation of this composite map and the platting thereon of the hydrography of 1854 and 1905. Without going into details in the matter, as I did with Mr. Hegardt, I will inquire of you whether or not you have made an examination of that map, and, if so, state the result of such examination as to its being accurate or not.

A. I have examined that map. The original was practically outlined in my office in Spokane by Mr. Hegardt and myself, and the present copy is an exact reproduction of that map and of the map upon which the original was based.

Q. You may state whether or not the additions which have been placed upon that map (I refer to the hydrography of 1854 and various colorings thereon) are correct and accurate.

A. They are.

Q. You have examined the original source, have you, so that you are able to tell from such examination that that is a correct reproduction?

A. I have. The hydrography of 1854 appearing on that map outlined in red and filled in in orange, is an exact transfer of the data contained on the U. S. Coast chart of 1854.

255

Q. Now I desire to direct your attention particularly to the line marked on this map "1905 Channel Line" and ask you what that indicates.

A. The line marked in black on that map and designated as "1905 Channel Line" is the modern ship channel as used by outgoing and in-coming deep sea ships.

Q. Are you aware from what data and information that line was drawn?

A. That line was based on the aids given to navigators, and follows the channel as buoyed.

Q. You speak of "aids to navigation". Kindly state what you mean by that.

A. "Aids to navigation" in this case are buoys and spars of different descriptions.

Q. You mean buoys and spars placed along the channel by the Federal government.

A. Yes sir.

Q. I observe at the extreme left end of this "1905 Channel Line" a buoy marked "Whistle." I wish that you would just tell us the various buoys along that line up as far as Astoria.

A. The channel line marked here in black and designated further as "1905 Channel Line" has its point of commencement immediately south of a buoy marked "whistle"; continuing farther on it passes a mid-channel buoy; following from thence easterly south of another buoy designated as "C 1½"; thence to the north of a buoy

marked "N 8;" thence southeasterly past a further buoy marked "C 3"; thence into the main Astoria or south ship channel.

Q. Now, the Federal government has a well-defined rule
256 or custom with reference to the placing of these buoys, spars and beacons, has it not?

A. It places them in the navigable channels.

Q. And they are of various colors, are they not?

A. Red and black.

Q. And are placed upon the——

A. A ship going in would leave the red on the right and the black on the left.

Q. Do you know whether or not the buoys and beacons which you have just referred to are the ones in present use?

A. From the information I can gain, they are.

Q. From an inspection of this map, Washington's Exhibit H, are you able to determine how late that map shows the existence of buoys?

A. That map was published originally in 1868, and has been brought up to June 28, 1906. All aids to navigation are corrected to that date.

Q. The aids to navigation which you refer to upon this little memorandum on the map, are those beacons and buoys concerning which you have just testified?

A. They are.

Q. Then, as I understand it, Mr. Jussen, the black line marked "1905" indicates the present ship channel?

A. The present ship channel.

Q. You may state whether or not there is another ship channel in the Columbia river below a line running from Astoria to Point Ellice which is in use for ocean-going steamers.

A. Not that I know of.

Q. Have you made a careful examination of all the information and data at hand to determine that question?

A. I have.

257 Q. You may state what the result of your examination was.

A. The result of the examination into the records and the existing conditions shows that only one route is at present followed by incoming or out-going vessels, that route being along the line indicated on Washington's Exhibit H in black and marked "1905 Channel Line".

Q. I wish you would further examine Washington's Exhibit H and tell us what channels appear to have been in existence and in use in the year 1854; or, if you prefer, you may take an original map published as of that hydrography.

A. The areas outlined in red and filled in with orange-color at the mouth of the Columbia river, as shown in Washington's Exhibit H, show the hydrographic conditions as existing during the year 1852, reproduced from a map published in 1854. There are here shown two channels entering the river designated as the north and south channels, respectively.

Q. State the color.

A. The sailing directions and range lines used at that time for the purpose of navigating these channels are marked in red, the plain dash (—) designates the sailing lines, while the two dots and dash line (..—) indicate the range lines.

Q. You may state, if you please, which channel was used by ocean-going vessels and steamers in 1854.

A. Both the north and south channels were used.

Q. Is there anything to indicate upon any maps or reports which have come to your attention that either channel was preferable?

A. There is a note contained on the original map of 1854, from which these colored areas now shown on Washington's Exhibit H are reproduced, to the effect that the south channel was al-
258 ways a safe-beating channel, either in or out.

Q. You may state, Mr. Jussen, whether or not the north channel of 1854, as delineated upon Washington's Exhibit H, passed north or south of Sand Island as it then existed.

A. The channel designated as the north channel and following the line in red on Washington's Exhibit H passed to the north of Sand Island as it then was.

Q. You may state whether or not that channel passed north of Sand Island as it now exists.

A. That channel passed to the south of the main part of Sand Island as it now exists.

Q. In fact it passes through the southern extremity of Sand Island?

A. It passes through the southern extremity of Sand Island.

Q. I wish you would describe the method which was used in reaching the initial point of this 1905 channel line.

A. On the maps of 1854 the sailing directions are given, together with the necessary range lines for both the north and south channels. From these range and sailing lines the initial point was determined as being in the center of the mouth of the north ship channel.

Q. I would be glad to have you indicate upon Washington's Exhibit H what you conceive to be the mouth of the north ship channel as it existed at that time.

A. The point indicated here at the crossing of the range line from Point Adams to Coxcomb Hill with a red line in a due east-west direction and marked here as "One marine League due west".

Q. Is this line marked "One marine league due west" a line which you obtained from some government publication? Is that a sailing line?

259 A. No.

Q. Will you be good enough to give me a sailing line or range line which intersects the one passing through Point Adams and Coxcomb Hill? I understand they are the ones which are referred to in the sailing directions upon the map.

A. The first sailing direction from the mouth and northeasterly direction of the north channel and its point of crossing with the range line from Point Adams to Coxcomb Hill, forms a junction

with the range line at the mouth of the river—the mouth of the north channel.

Q. It is practically the same point where the Coxcomb-Point Adams line intersects the "one marine league due west" line.

A. "One marine league due west line," yes .

Q. I wish you would define what you understand to be the meaning of the term "mouth of the channel."

A. The mouth of a channel, or the mouth of a river, rather, I would consider to be that point where the stream leaves the confining influences of both headlands and spits.

Q. In other words, it is that part of the channel or channel of a river at which its waters are discharged into the ocean or into a lake?

A. It is.

Q. Did you hear the testimony of State Engineer Lewis of Oregon the other day, taken in Astoria?

A. I did.

Q. Are you familiar with the initial point of the line as drawn by him, being the boundary line as claimed by Oregon?

A. I am.

Q. I desire to direct your attention to Washington's Exhibit H again, and point you to the initial point as claimed by Mr. Lewis, which I understand to be the eastern extremity of this
260 straight line in blue under which appears the word "boundary"; and I will ask you to state from your examination of the maps and records whether or not there was channel at that time from that initial point running westerly along or approximately along that line produced into the ocean.

A. No sir, there is no channel of that kind.

Q. You may state, if you know, the course which was then pursued by ocean-going vessels and steamers of larger size in coming from the ocean to Astoria.

A. When sailing by the north channel, after passing the mouth of the channel, sail in a north-easterly direction to range line running from Cape Bluff to Leading In Cliff; thence directly on to Cape Disappointment until the northern extremity of the Middle Sands, designated on the map as Sulphur Spit, is reached; thence easterly past Sand Island to and into the south channel.

Q. Those courses and ranges which you have just described were obtained by you from whence?

A. Those courses and ranges are more fully described on the original map, of which this is a reproduction.

Q. And that original map was published by the Federal government?

A. Yes. In 1854.

Q. You may state whether or not that course which you have just described went as far north as this blue line marked upon Washington's Exhibit H and marked as "boundary line as claimed by the State of Oregon".

A. It did not.

Q. I will ask you generally, Mr. Jussen, whether or not you have

been able to ascertain from your examination of the official maps and documents that at any time in the history of the Columbia river, since the official publication has been made, there ever
261 existed a course pursued by ocean-going or other vessels, as shown by this boundary line as claimed by the State of Oregon—the line in blue on this map, Washington's Exhibit H.

A. There is no evidence of any channel existing or ever having existed as shown by that blue line between Cape Disappointment and Chinook Point.

Q. You may state from such examination whether you are able to find that the ship channel ever went as far north into Baker's Bay as shown by that blue line.

A. It never has.

Q. I wish that you would state the earliest publication furnished by the government concerning the hydrography of the Columbia River entrance.

A. The charts of 1851 and 1852 are the earliest government publications covering the hydrographic conditions at the mouth of the river.

Q. Does not the Federal government now publish a chart or map known as the Vancouver map?

A. It does.

Q. I should be glad to have you refer to that and tell us what channels are shown upon that map and how they compare with the present channel of 1905.

A. Admiral Vancouver's sketch of the mouth of the Columbia river was made in 1792. This is the map referred to under Washington's Exhibit C. This map shows but a single channel entering the river.

Q. How does that channel compare with the present ship channel of the Columbia river?

A. The northern boundary or 18-foot contour line of that channel ran due west from Chinook Point, passing approximately
262 three-quarters of a mile south of Cape Disappointment, and forming a deep pocket into Baker's Bay. The southern boundary, although it is not marked as such, would probably be known as Clatsop Spit, extends westerly parallel with the northern 18-foot contour line, but about a mile and a half south of it. This southern line is practically in the same position as the line marked on Washington Exhibit H, the 1905 channel line.

Q. You may state whether or not Sand Island appears to be designated upon the Vancouver map.

A. Sand Island is not designated on the Vancouver map, nor are there any soundings given just west of Desdemona Sands.

Q. Are you able to tell from an examination of the Vancouver chart, where that channel which you have referred to passes with reference to Sand Island as it existed in 1839, which I understand to be the first date which the island is shown by any maps?

A. Sand Island as it existed in 1839 would practically be in the middle of the channel as shown on the Vancouver sketch.

Q. You may state what is the next government map in point of time after the Vancouver map.

A. The map covering the survey of Sir Edward Belcher.

Q. And that is marked Washington's Exhibit C?

A. Washington's Exhibit C. The date of this map is 1839.

Q. You may describe briefly the channels as shown upon the Belcher map, Washington's Exhibit C, and compare them with the channels as shown on the Vancouver map of 1792.

A. The Belcher map shows two channels in place of the one shown on the Vancouver map. These channels follow around a
263 triangular area of sands, which at its eastern end shows for the first time what is now known as Sand Island.

Q. You may state whether or not Sand Island as such appears to be delineated upon this Belcher map.

A. It does, in the eastern portion of the triangular area of sands mentioned.

Q. I understood you to say there were two channels entering from the Columbia River as shown on this map.

A. There were.

Q. You may state whether or not you are able to determine from an examination of that map which was the ship channel used by ocean-going steamers and vessels in coming from the Pacific ocean into and up the Columbia River.

A. The main channel was the north channel, which in point of width and depth exceeded the more southerly one.

Q. The depths, I take it, are shown upon this map in the figures which appear in the various channels?

A. They are.

Q. The soundings appear in fathoms, do they?

A. In fathoms.

Q. Now you may state whether or not the north ship channel passes north or south of Sand Island.

A. The north ship channel as there outlined passes to the north of Sand Island as it then was.

Q. What is the character of the south channel as to its being navigable for deep-sea ships?

A. The south channel would be navigable for deep sea going ships, and shows a ruling depth of 3 and a half fathoms of water at the mouth.

Q. You may state which of those channels appears to be the shorter and more direct from the ocean.

A. The southerly channel is the more direct channel from the ocean.

264 Q. Do you know by whom this Belcher map was prepared?

A. By an admiral of the English navy.

Q. You may state whether or not this map is now being issued or has been issued in government publications of the United States.

A. It has.

Q. You may now state, Mr. Jussen, what is the next map in point

of time showing the hydrography of the lower part of the Columbia River.

A. The next map in point of time is the United States Exploring Expedition map made under the supervision of Charles Wilkes.

Q. And that is dated 1841, is it?

A. That is dated 1841.

Q. By what department of the Federal government, if any, is that map issued?

Senator FULTON: I submit an objection that the witness cannot consult with others to determine the authority by whom the map was issued, and further that the map shows for itself.

Q. Examine the map. The map is issued, is it not, from the office of the Coast and Geodetic Survey of the Department of Commerce and Labor, as shown by the certificate attached to it?

A. It is.

Q. You may state, if you know, or are able to determine from the map, under what authority or under the direction of what department the map was prepared or the Expedition sent out.

A. The map bears the inscription: U. S. Exploring Expedition, Charles Wilkes, Esq., Commander.

265 Q. I will ask you to state whether or not you have compared the hydrography of the Wilkes map of 1841 with the hydrography of the Sir Edward Belcher map of 1839, and if so, kindly state the result of such comparison.

A. I have compared the hydrographic conditions as shown on the map of 1841, known as the Wilkes map, with that of the Belcher survey or map of 1839. The hydrographic conditions are very similar, except that the Wilkes expedition shows a junction of the south and north channels on entering the ocean.

Q. In other respects, then, I understand the two maps conform in all essential details?

A. They conform in all essential details. The map of 1839 shows a swash channel connecting the south channel with the north channel at the point indicated on Washington's Exhibit H in blue.

Q. That is at the extreme——

A. At the extreme westerly end of the Middle Sands.

Q. On the bar of the Columbia River.

A. On the 1841 map, this swash channel has developed into a broad, deep channel, from the western continuation of what is known as the Queen's or Clatsop channel into the ocean.

Q. I have observed in examining some of these maps that Queen's channel is the name given to one of the southerly channels. You may state what is the name of that channel at the present time, and also give any other names which have been given to the same channel as you have discovered from an examination of these government reports and maps.

A. The Queen's channel, designated on the map of 1839, is practically the Clatsop channel as shown on the map of 1841.

Q. Is the Clatsop channel the same channel which is sometimes termed the Astoria channel?

266 A. The Clatsop channel is really that portion of the Astoria channel lying to the west of Point Adams?

Q. Now you may state what map was published by the government next in point of time after the Wilkes map.

A. The next map in point of time published by the government is by the U. S. Coast Survey, and bears the date of 1851.

Q. I wish you would state briefly what channels are shown by the 1851 map and how those channels compare in width, depth and location with the channels as shown by the Belcher and Wilkes maps.

A. The channel conditions shown on the map of 1851 are somewhat similar to those outlined on the maps of 1839 and 1841, but differ in that the south channel has been forced to the north.

Q. Approximately how far?

A. I should judge that the south channel immediately abreast of Point Adams had been forced about a mile to the north.

Q. By what actions of nature was that channel forced north?

A. The building on to Clatsop Spit has forced this portion of the channel north since subsequent to 1839.

Q. I wish you would compare the north channel of the 1851 map with the maps of 1839 and 1841, respectively, the Belcher and Wilkes maps.

A. Comparing U. S. Coast Geodetic Survey map of 1851 with the Sir Edward Belcher survey of 1839, it is shown that the mouth of the north channel has not shifted materially in position.

Q. You may state which of the channels shown on the map of 1851 is used by the deep sea vessels and steamers in coming from the ocean into the Columbia River and Astoria and to points further up.

267 A. Both of the channels designated as north and south ship chanels, respectively, were used by ships in coming from the ocean going to Astoria and Portland.

Q. Is there anything upon those maps, sailing directions, aids to navigation, beacons, buoys, or otherwise, to indicate which is the preferable channel for deep sea vessels of the deepest draught?

A. Under sailing directions on the map of 1851, it says that the "south channel is a safe-beating channel either in or out."

Q. What reference, if any, is made to the north channel?

A. Under the heading of north channel, or, rather, entering the north channel, given under the sailing directions on the map of 1851, is this statement: "The cross tides in the north channel and the baffling wind near Cape Bluff make this channel very difficult for sailing vessels."

Q. You may state which of those channels appears to be the shorter and more direct from the ocean to Astoria.

A. The southerly or south channel would be the more direct channel at that time from the ocean to Astoria.

Q. Is Sand Island shown upon this map of 1851, Oregon's Exhibit No. 4?

A. Sand Island is designated on that map by the words "Sand Island," and the further statement on the western end of the island "Bare at low water."

Q. You may compare the area and location of Sand Island as it appears on Oregon's Exhibit No. 4, the map of 1851, with the last preceding map, which was the one of 1841, the Wilkes map.

A. The Sand Island as shown on the U. S. Coast Survey map of 1851 is similar in shape, but to the north of the area designated as "Bare" by the Wilkes expedition of 1841.

Q. You may state whether or not it has increased or de-
268 creased in territorial extent.

A. The island has somewhat increased in territorial extent.

Q. You may state whether or not sailing directions appear upon Oregon's Exhibit No. 4, being the map of 1851.

A. The sailing directions are given on the map.

Q. For which channels?

A. For both the north and the south channels.

Q. Are there any aids to navigation platted upon that map?

A. No sir.

Q. Do you observe any beacons or buoys?

A. There is a beacon on Sand Island, and the head lights, I suppose.

Q. I wish you would tell us the next government publication in point of time after Oregon's Exhibit No. 4, the map of 1851. Before I leave the map of 1851, let me inquire whether there are any anchorage grounds shown upon that map.

A. There are.

Q. You may state where they are.

A. The anchorage ground designated as the lower anchorage ground on the map of 1851 is shown to the east of the Middle Sands, approximately southeast of the eastern end of Sand Island.

Q. Approximately how far south of the southern extremity of Cape Disappointment would those anchorage grounds be?

A. The anchorage grounds just referred to would be 2 miles and a half south of Cape Disappointment on a line.

Q. Are there any anchorage grounds shown in Baker's Bay, Queen's channel, Clatsop channel, or Astoria channel?

A. On the map of 1851 an anchorage is shown in the Clatsop channel, designated as Clatsop anchorage, immediately north of Tansy Point.

Q. Are there any anchorage grounds shown east of Tansy
269 Point and between that and Point Astoria?

A. Immediately abreast of the U. S. customs house, as indicated on the publication of 1851, there is another anchorage shown.

Q. You may state whether or not Point Ellice appears in this map of 1851?

A. It does.

Q. Does Knappton appear there?

A. No sir.

Q. You may state whether or not there are any anchorage grounds shown upon any channel which may pass on the north shore of the river and close to the Washington shore.

A. There is no anchorage shown there on the map of 1851.

Q. I believe you have already testified as to the sand movements of Sand Island with reference to this map, have you?

A. Yes.

Q. You may state whether or not there is any indication of the existence of a middle channel as shown by the map of 1851.

A. No sir.

Q. You say there is no evidence of the existence of a middle channel?

A. There is no evidence of the existence of a middle channel of that date.

Q. Now kindly pass to the next map in point of time and we will discuss that.

A. The next map in point of time is the U. S. Coast Survey map of 1854.

Q. The hydrography of that map appears as of 1852?

A. As of 1852.

270 Q. You may compare the channels as shown by the 1854 map with the channels as shown by the 1851 map.

A. The hydrography and topography of the map of 1854 do not extend any further eastward than a line drawn north from Tansy Point.

Q. To Point Ellice?

A. To Chinook Point.

Q. What channels are shown by the 1854 map, Oregon's Exhibit No. 5?

A. This map, Oregon's Exhibit No. 5, shows two channels designated as north channel and south channel.

Q. Compare them with the channels as shown on the next preceding map with reference to location, size, depth, movement.

A. The point of entrance to the north channel is approximately the same on both charts. The south channel, northeast of Point Adams, has been crowded a little farther to the north in 1854 than it was as shown on the map of 1851.

Q. Which appears upon the map of 1854 to be the main ship channel from the ocean to the upper river?

A. On the map of 1854 the south channel seems to be the main channel of the river.

Q. Are there any sailing directions or range lines platted on that map of 1854?

A. Yes sir.

Q. What channel do those lines indicate to be the main ship channel?

A. The sailing directions given on that map indicate the south channel as being the main ship channel.

Q. You may state whether or not the south channel of 1854 passes north or south of Sand Island.

A. The south channel of 1854 passes to the south of Sand Island.

271 Q. And how about the north channel?

A. The north channel as thereon indicated passes to the north of Sand Island.

Q. Taking the north channel of the map of 1854, you may state whether or not that passes north of where Sand Island is at the present time.

A. The north channel shown on the map of 1854 passes through the southern portion of Sand Island as it now is.

Q. And that is shown on Washington's Exhibit H, marked "North channel 1854?"

A. That is right.

Q. Now I wish you would compare the movements, if any, of Sand Island as shown upon the map of 1854 with the next preceding map, of 1851, Oregon's Exhibit No. 5. I desire you to compare the location and movement of Sand Island as shown in Oregon's Exhibit No. 5, which I understand to be the map of 1854, with Oregon's Exhibit No. 4, the map of 1851.

A. Sand Island occupies practically the same position on both maps.

Q. You may state whether or not it has increased or decreased in area in 1854 as compared with 1851.

A. Sand Island has changed in shape but the area is not much greater.

Q. I wish you would examine the map of 1854 and give me the ruling depths in Baker's Bay, if they be shown on that map.

A. Passing from the north channel into Baker's Bay, the map gives a ruling depth of 7½ fathoms.

Q. Of how much?

A. Of 7 and one-half fathoms.

Q. Whereabouts is that?

272 A. Immediately southeasterly of Cape Disappointment.

Q. Now just give the depths as shown on that map along the course which would be shown or delineated by the blue line on Washington's Exhibit H, which is the boundary line as claimed by the State of Oregon. Just take this blue line and mentally transpose it to the map of 1854, and give the depths which would then appear upon that line if platted upon the 1854 map.

A. The blue line delineated on Washington's Exhibit H, and further designated as the "Boundary line as claimed by the State of Oregon," after leaving Cape Disappointment would pass through Baker's Bay, as indicated on the map of 1854, and thence easterly within the 18-foot contour limit shown on that map.

Q. You may state whether or not the map of 1854 shows a ship channel north of Sand Island as it exists at the present date.

A. It does not.

Q. Or following along the Washington shore from Chinook Point and Point Ellice up to Knappton?

A. There is no ship channel designated on the map of 1854 as existing north of the present confines of Sand Island.

Q. How about it from Chinook Point on to Point Ellice and Knappton?

A. The map of 1854 terminates at Chinook Point.

Q. Is there any evidence on the map of 1854 of the existence of a middle channel?

A. No sir.

Q. Do you know what is the date of the map published by the government nearest to the admission of Oregon into the sisterhood of States, which I believe was in 1859?

273 A. The map of 1854.

Q. Is that the map from which you have just been testifying?

A. Yes.

Q. You say there is no evidence upon that map of the existence of a middle channel?

A. No sir, there is not.

Q. Take up the map next in point of time published by the government. I think it is Oregon's Exhibit No. 9.

A. The next map published by the government in point of time bears the date of 1870.

Q. Of what date is the hydrography as contained on that map?

A. The hydrography shown on that map is of date 1868.

Q. What is the number of that exhibit?

A. Oregon's Exhibit No. 9.

Q. I desire you to take up Oregon's Exhibit No. 9 and tell me what channels appear to be shown on that map—I mean ship channels from the ocean to the upper river.

A. There are two ship channels shown on that map—a northern channel and a southern channel, the southern channel being wider and deeper than the northern.

Q. How does the southern channel compare with the channel of 1854? I mean the south channel of 1854.

A. The south channel is fully as wide as in 1854, has about the same point of entrance, but is a little farther north, at a point northwest from Point Adams.

Q. But the mouth of the channel is practically the same?

A. It is in practically the same position.

Q. How about the entrance of the north channel?

A. The entrance to the north channel is approximately half a mile farther north on the map of 1868 than on the map of 1854.

274 Q. Is the most northerly part of that north channel closer to Cape Disappointment, as shown by Oregon's Exhibit No. 9, than it is as shown by the map of 1854 and by the red line on Washington's Exhibit H showing the north channel?

A. The center of the north ship channel immediately opposite or south of Cape Disappointment is a little closer in on the map of 1868 than on the map of 1854.

Q. Then, the channel has been moved northward slightly?

A. Yes sir.

Q. You may state whether or not an examination of Oregon's Exhibit No. 9, discloses whether the north channel passes north or south of Sand Island.

A. An examination of Oregon's Exhibit No. 9, representing the map of 1870, shows the north channel to pass to the north of the area indicated thereon as Sand Island.

Q. You may state whether or not the north ship channel of Oregon's Exhibit No. 9 passes north or south of Sand Island as it exists at the present time.

A. The channel designated as north channel on the map of 1868, or rather in reference to the map of 1868, passes through the southern portion of the present Sand Island.

Q. You may state whether or not it appears from Oregon's Exhibit No. 9, which is the better channel from the ocean to the upper river for ocean-going steamers or vessels.

A. The southern channel would be the better channel.

Q. For what reasons?

A. It is wider and of better depth.

Q. I desire to inquire of you whether or not the maps published by the government between 1839 and 1870 show a gradual deterioration or shoaling and narrowing of the north channel in Baker's Bay.

275 A. The maps referred to and dating from 1839 to 1868 show an increase in length of Clatsop Spit, a gradual northerly movement of the south channel, and a corresponding shoaling and deterioration of the north channel.

Q. You may state whether or not a middle channel appears to exist on Oregon's Exhibit No. 9, the map of 1870 and the hydrography of 1868.

A. In the section between Tansy Point on the south and Point Ellice on the north, on the map of 1870, showing the hydrographic conditions of 1868, there is a middle channel immediately north of the shoals which, although not designated on this map as Desdemona Sands, are probably identical with what is now known as Desdemona Sands.

Q. What appears to be the ruling depth of that middle channel?

A. The ruling depth of that channel at its point of entrance is 3 and ¾ fathoms.

Q. And I understand the point of entrance from the north channel is approximately on a line drawn from Tansy Point to Point Ellice?

A. The entrance as there shown would be midway on a line drawn from Tansy Point to Chinook Point.

Q. I mean to say to Chinook Point, instead of Point Ellice. How far does that middle channel extend in an easterly direction from the point of commencement just designated by you?

A. This channel extends easterly to the limits of the map, but immediately north of a point designated on this map as Smith Point it shows a contraction and some shoaling.

Q. Does an examination of that map, the hydrography shown as of the middle channel, indicate that it could be used or was used as a ship channel?

A. It could have been used at that time for light draught vessels.

276 Q. Could it have been used for the deepest draught ocean-going steamers and vessels?

A. I think not.

Q. Is there anything to indicate upon that map, such as sailing directions, beacons, buoys, spars, or otherwise, that it actually was used as a ship channel?

A. No, there is not.

Q. Please tell me, if you can, the nearest hydrography of the river on Oregon's Exhibit No. 9 at a point shown above Oregon Exhibit No. 9—that is, the portion of the river from Tongue Point up to Three Tree Point. In other words, I want to extend this up the river. I want to extend the hydrography up the river as soon as I can get two maps which were made at or about the same time.

A. Oregon's Exhibit No. 7 shows hydrographic conditions as exisiting east of Astoria and from there up to Three Tree Point during 1867 and 1868.

Q. Now take the map showing the hydrography of 1867 and 1868 below Tongue Point or Astoria.

A. This is shown on Oregon's Exhibit No. 9.

Q. Oregon's Exhibit No. 9 is the exhibit which shows the mid channel, is it?

A. Yes sir.

Q. Now turn to Oregon's Exhibit No. 7, and tell me whether or not that shows the existence of a middle channel easterly from Astoria.

A. Oregon's Exhibit No. 7, forming the continuation of sheet No. 1 up the river, shows a middle channel, a direct continuation of the one described as existing on Oregon's Exhibit No. 9.

Q. Now tell me what the ruling depths of that channel are as shown upon sheet No. 2, and the length of that middle chan-

277 nel in its extension from that portion shown on sheet No. 1, Oregon's Exhibit No. 9.

A. The ruling depth as there shown would be between 5 and 6 fathoms of water.

Q. How far does that channel extend and into what other channel, if any, does it come?

A. The channel extends from the western edge of the map marked Oregon's Exhibit No. 7 easterly to Tongue Point, where it joins what is known as Woody Island Channel.

Q. That channel is of sufficient depth so that it might be used as a ship channel, is it?

A. It is.

Q. Now I wish you would take the map next in point of time from Oregon's Exhibit 9. That is the last one you testified to, isn't it?

A. Yes.

Q. Of the mouth of the river. That would be Washington's Exhibit H, would it not?

A. Washington's Exhibit H.

Q. You may state whether or not upon Washington's Exhibit H this middle channel appears; I mean the middle channel concerning which you have just been testifying.

A. It does.

Q. What are its ruling depths?

A. Its north entrance would have a ruling depth of 12 feet.

Q. You may state whether or not that would be a sufficient depth to admit of the passage of ocean going steamers and vessels of the largest draught at low tide.

A. No sir.

Q. The 12 feet that you speak of is the depth at mean low tide.

A. Mean low tide.

278 Q. You may state whether or not there is anything upon Washington's Exhibit H to indicate that that middle channel is used as a ship channel.

A. It is not provided with aids to navigation.

Q. No aids whatsoever.

A. None at all.

Q. What is the map next in point of time after Oregon's Exhibit 7 giving the hydrography of the river up from Tongue Point or Astoria?

A. Washington's Exhibit I, forming the up-river continuation of sheet 1, gives the hydrography of 1867 and 1868, and a resurvey of the main channel to buoy No. 14 in 1885.

Q. Before proceeding with a discussion of Washington's Exhibit I, I should like again to direct your attention to Washington's Exhibit H and inquire of you whether or not any shipping channels are shown upon that map except the one delineated by the black line marked 1905 channel line.

A. You mean the present ship channel?

Q. Yes sir.

A. There are no other channels shown on that map provided with aids to navigation.

Q. What other channels, if any, are shown upon that map?

A. There is a north channel shown on that map.

Q. You may state whether or not it appears as a ship channel.

A. It is not provided with aids to navigation.

Q. You may state whether or not that ship channel as shown upon Washington's Exhibit H is of sufficient depth to admit of the passage of ocean-going vessels over that particular portion of the river which is shown on that map.

A. The soundings there given would permit of its navigation by deep sea going vessels to a point just south of Knappton.

279 Q. Just south of Knappton?

A. Yes sir.

Q. What is the ruling depth of that channel following closely to the Washington shore between Point Ellice and Knappton?

A. 38 feet up to the point indicated.

Q. Now take that north channel following closely to the Washington shore, and continue it from Knappton on as shown on Washington's Exhibit I, and tell me what the ruling depths there are and

whether it is of sufficient depth to admit of the passage of ocean-going steamers.

A. Continuing the channel referred to easterly would lead into a series of shoals between Knappton and Gray's Point.

Q. And the channel gradually dies out in these shoals, so that it is not possible to navigate it by steamers of the deepest draught.

Senator FULTON: I object to that as leading.

Mr. MACDONALD: I will withdraw the question.

Q. You may state whether or not that channel easterly from Knappton may be used by steamers of the deepest draught.

A. It cannot.

Q. I wish you would closely examine Washington's Exhibit H and tell me whether or not the Chinook Point—Point Ellice—Knappton channel is buoyed up as far as Knappton.

A. The channel leading to Knappton, that is, from Point Ellice to Knappton, is buoyed on this map.

Q. You may state whether or not the channel is buoyed beyond Knappton upon that part of the river shown on Washington's Exhibit I.

A. The exhibit referred to shows one buoy——

Q. On Exhibit I?

A. On Exhibit H—immediately ½ mile east of Knappton.

280 Q. Now how about the buoys appearing on Washington's Exhibit I on the same channel?

A. There are no buoys shown on Washington's Exhibit I in the continuation of this channel.

Q. Now, take that channel going in an almost easterly direction from Point Ellice just south of the Point Ellice and Knappton channel, and give me the ruling depths of that channel as disclosed by Washington's Exhibit H.

A. The channel referred to in the question terminates immediately south of a point indicated on Washington's Exhibit I as Gray's Point; at its entrance immediately south of a point designated as Cliff Point on Washington's Exhibit H this channel shows depths of 45, 30 and 33.

Q. Feet or fathoms?

A. Feet.

Q. You may state whether or — it is possible for ocean-going vessels or steamers to navigate that channel up the river on their way to Portland.

A. As stated, this channel terminates at a point south of Gray's Point shown on Exhibit I of the State of Washington.

Q. Therefore it is not possible to navigate it?

A. It is not possible to navigate this channel.

Senator FULTON: What channel is that?

WITNESS: The south channel.

Mr. MACDONALD: This channel here, Senator. (Pointing on map.)

Q. You may state whether or not this southerly channel leading

off from Point Ellice just below Knappton is buoyed, and, if so, between what points.

A. The channel referred to is not provided with any aids to navigation whatsoever.

Q. Assuming that an ocean-going vessel or steamer had pursued a course up the Columbia River and had reached the point
281 of Knappton, what course would that vessel then be compelled at the present time to pursue to reach Portland?

A. A vessel at Knappton, a deep sea going vessel, would be forced to retrace its course as far as the western end of what is now known as Desdemona Sands, where it would find entrance into the south or main channel of the river.

Q. And that channel is marked on Washington's Exhibit H in what manner?

A. That channel is marked on Washington's Exhibit H in black and further indicated as "1905 channel line."

Q. You may state whether or not there is any course or channel in that part of the river covered by Washington's Exhibit H which could be pursued by ocean-going vessels in going to Portland or other points on the upper river than that shown by the black line 1905.

A. No sir.

Q. Please examine the map and tell me the ruling depths of the main channel abreast of Astoria.

A. Immediately abreast of Astoria, 59 feet.

Q. Are you sure of that, Mr. Jussen? You heard the testimony the other day of pilot Gunderson, who testified the depth there was 20 feet?

A. There are a number of figures given here—37, 45, 41, 35, 39—all within the east and west extent of the town of Astoria, as outlined on that map.

Q. What is the depth in front of Knappton?

A. 17 feet.

Q. What is the ruling depth between Point Ellice and Knappton?

A. The controlling depth would there be 21 feet.

Q. Well, where is this 17-foot depth?

A. That is immediately east of Knappton.

282 Q. Twenty-one feet, then, is the ruling depth between Point Ellice and Knappton—the controlling depth between Point Ellice and Knappton?

A. Between Point Ellice and Knappton. The soundings given in the channel at Knappton are as follows: immediately east 15 feet, 17 feet; a little south, 12 feet; and just north of the buoy indicated in red, 21 feet.

Q. Do you know when the Federal government commenced the construction of the Fort Stevens jetty?

A. I am informed it was in 1885.

(Mr. Hegardt stated it was in 1885.)

Q. From an examination of the various reports made by the government with respect to the construction of this jetty and the

maps which have come under your observation, you may state what the effect of the construction of that jetty was upon the channels at the entrance of the Columbia River north of such channel.

A. The purpose, as I understand it, of the construction of that jetty, was to contract the entrance so as to form one channel.

Q. What was its effect upon the channel with reference to the amount of sand and the sand movements?

A. The effect of the building of the jetty was to absolutely clear the line determined upon as the most suitable one for the main channel of all sands.

Q. You may state, generally speaking, whether the construction of that jetty has had the effect of moving the ship channel north or south.

A. The effect of the construction of that jetty has been to throw the channel to the north.

Q. Now, what has been its effect, if any, upon the deterioration or shoaling of the northern part of the river, and particularly
283 in Baker's Bay?

A. Baker's Bay has undergone a shoaling which, commencing in 1868, has practically continued to the present date.

(A recess was here taken until 2 o'clock p. m.)

Q. Calling your attention again to Washington's Exhibit H, I will ask you to inform us, Mr. Jussen, what, if any, anchorage grounds are platted upon that map, giving the location.

A. On Washington's Exhibit H, an anchorage is platted and noted as the lower anchorage. This anchorage is indicated by an anchor marked "Lower anchorage" in red. The same is a mile and three-quarters southeast of the old Sand Island as indicated on that map in red.

Q. Are there any other anchorage grounds shown?

A. That is the only anchorage that I note on the exhibit referred to.

Q. I wish you would closely examine Washington's Exhibit H in the immediate vicinity of Tansy Point and see whether or not any anchorage grounds are platted there.

A. Yes, there is; just north of Tansy Point is an anchorage platted in green or marked in green, "Clatsop anchorage."

Q. Did you hear the testimony the other day of Captain Fisher wherein he stated that the south channel would require more dredging to maintain than the north channel?

A. I did.

Q. You may state what, in your opinion, are the facts with reference to that.

A. In my opinion it would not require as much dredging to maintain a certain depth of water as would the north channel.

Q. Now we will take up a discussion of the movement of Sand Island, and I will ask you to relate its history from the time wherein it first appears as being platted upon the government charts
284 or maps of the entrance of the Columbia River.

A. I would like to refer to those earlier maps. Sand

Island is first indicated on the Edward Belcher survey of 1839. It is there shown as a narrow strip having a general southeasterly and northwesterly direction. It is approximately one and one-half miles in length. It starts at a point due north one and one-half miles from Point Adams, extending in a northeasterly direction towards Cape Disappointment along the eastern boundary of the so-called Middle Sands.

Q. Before leaving that map, Mr. Jussen, let me inquire of you whether or not Sand Island appears to be bare at high water, or is it only at low water?

A. Sand Island here is indicated as bare at low water. On the map next at date, namely, the Exploring Expedition under command of Commander Wilkes, 1841, Sand Island as such is not indicated, but there are in the eastern portion of the triangular area designated as Middle Sands two bare areas which in point of position would indicate that they were what was then termed Sand Island on the map of 1839. The more southerly area has an easterly and westerly course, while the more northerly follows the same course as indicated on the map of 1839. The more southerly of the areas designated as "bare" on the Wilkes map has shifted somewhat farther north than the southerly portion of the ground designated as Sand Island on the map of 1839. On the map next in date, namely, the map published in 1851 by the Coast Survey, Sand Island is indicated as an area marked "Sand Island" and "Bare at low water." This area has an almost east and west extent, being approximately one and one-half miles in length and having a width of about three-eighths of a mile. Its easterly edge has moved towards the west and is now 2 miles distant north from Fort Stevens.

285 On the map of 1854, based on the hydrography of 1852, Sand Island is shown to be still farther west of Point Adams than indicated on the map of 1851. The island, as shown on this map, has a length of one and one-half statute miles in an easterly direction, a branch trending towards Cape Hancock, three-quarters of a mile in length and following the eastern border of the Middle Sands.

Q. Just let me inquire at that point as to whether or not Cape Disappointment and Cape Hancock are the same point.

A. They are. On the map of 1870, bearing the records of the hydrographic surveys made in 1867 and 1868, Sand Island is indicated as having a length of about a mile and a quarter in an east and west direction, and a width of from one-quarter to not quite half a mile in a north and south direction. The island has shifted considerably to the west of its position as shown on the map of 1854, and has also travelled towards the north on a line connecting Point Adams with Cape Disappointment, and the most modern map offered in evidence, and which is designated as Washington's Exhibit H, shows Sand Island as being almost wholly within a line connecting Cape Disappointment with Point Ellice. It is here shown as a tract very much greater in extent than any of the other maps referred to and consists of two parts: a southern part elongated in an eastern direction, and a northerly or main island having a

general north and south direction. The general travel of Sand Island since 1839 up to the date of the last survey has been in a northwesterly direction or on a line connecting Point Adams with Cape Disappointment.

Q. Did I understand you to say that Sand Island was now north of a line drawn from Cape Disappointment to Point Ellice?

A. Well, not in exactly a straight line, but within a line of moderate curve extending from Point Adams to Point Ellice.

Q. I wish now to inquire whether or not the Columbia River is a silt-bearing stream.

286 A. The Columbia River has a drainage area which extends from away above the British Columbia line, down through the states of Washington and Oregon to the Pacific Ocean, somewhat over 1200 or 1500 miles in length measured on the river's course. It is a stream fed at its head waters by rivers which are active in their erosive work, and at the period of flood carries with it, suspended in it, a great deal of detritus and finer silt, which are the products of the erosive action it exercises at its head-waters. These sands are deposited along its course in bars and spits and are carried clear to the mouth where they are arranged when coming in contact with the littoral or shore currents into the spits and bars characterizing the mouth of the Columbia River. A great deal of the silt passes from the control of the channel currents to the control of the littoral currents, which convey it along the coast in a general northerly direction, filling in indentations; simplifying the coast line generally.

Q. You may state what is the prevailing direction of the littoral currents on the Pacific Coast, we will say between San Francisco Harbor and Cape Flattery.

A. Towards the north.

Q. Now let us take up for discussion Washington's Exhibit I. First explain what the black line thereon marked "1905 channel" indicates, and from what data and information that line was drawn.

A. Washington's Exhibit I or sheet 2 of the Columbia River extends from a point westerly of Tongue Point to a point easterly of Three Tree Point. Within that distance there is shown a

287 black line marked 1905 channel line. This channel line indicates the present course taken by deep sea going vessels when going to or coming from Portland.

Q. Does that line indicate the present main ship channel of the Columbia River?

A. The black line indicates the present main ship channel of the Columbia River.

Q. Now please tell us what the most northerly line there, which is indicated in blue, designates?

A. The most northerly line shown on that map in blue and marked "Boundary line as claimed by Oregon," indicates the boundary line as established by the State of Oregon.

Q. That line is a reproduction from the line as delineated upon the map contained in the answer of the State of Oregon?

A. It is.

Q. Now we will take up the red line marked "1859 channel line," and I will ask you to explain what that is and from what information that line is derived, taking the line south of Snag Island and through Woody Island channel.

A. The line marked in red and designated as "1859 channel line," extending easterly from Tongue Point to and opposite Brookfield, is the channel line used in 1859.

Q. Do you mean by that, that it indicates the main ship channel used in 1859?

A. The main ship channel as used in 1859.

Q. Now take that portion of the red line marked with the figures 1875, which runs through Cordell channel just north of Snag Island, and explain what that indicates and upon what information or data it is based.

A. The channel line marked Woody Island at buoy indicated as 14 on the exhibit in question, and extending through the Cordell channel to the buoy indicated as No. 19 on the same exhibit, 288 was a channel discovered by Cordell in making the survey of the river in 1867 and 1868.

Q. You may state whether or not that Cordell channel was ever used as the main ship channel of the river between Tongue Point and Three Tree Point.

A. It was.

Q. During what years, if you know?

A. From 1870 to 1875.

Q. Now, do you observe upon Snag Island two black lines which meet in an obtuse angle?

A. On the map there are shown two lines meeting on Snag Island, one of which has a general eastern and western direction, while the other one pursues a northeasterly course.

Q. You may state, if you know, what those lines indicate.

A. Those lines indicate the position of the jetty constructed by the Port of Portland in accordance with the federal project of 1891.

Q. Do you know whether or not work as done by the Port of Portland Commission was under the supervision of any department of the Federal government?

A. It was.

Q. You may state under what department.

A. Under the Engineering Department.

Q. The corps of engineers of the United States Army?

A. The corps of engineers of the United States Army.

Q. Now, taking that map at Three Tree Point, you may state from what direction the current of the channel comes down the river towards Three Tree Point.

A. The waters of the Columbia River come towards Three Tree Point from a southeasterly direction.

Q. I desire to inquire of you what would be the natural course of the river coming, as you have said it does, towards Three Tree Point, beyond that point if unaided by any artificial means.

289 A. The natural course which would be pursued by the waters of the Columbia River upon leaving Three Tree Point would be to follow the Woody Island channel, that being a direct continuation of the curve formed by the north shore between Three Tree Point and the edge of the map indicated as Exhibit I.

Q. Then, the course would be from Three Tree Point down towards and upon Snag Island, would it not?

A. Yes, and from Snag Island through what remains of the Woody Island channel to Tongue Point.

Q. You may state what effect, if any, in your opinion, the construction of that jetty on Snag Island had with reference to deflecting or changing the current from the course which it had previously pursued, which I understand would be from Three Tree Point down to either Woody Island channel or Cordell channel until the construction of the jetty crossed its mouth, and thereon to Tongue Point.

A. The construction of the jetty indicated on the map in black would have the effect of dividing the waters of the Columbia River in such a manner as to throw only a portion of it through the Woody Island channel, the balance pursuing the course along the Washington coast.

Q. You may now state whether or not the construction of that jetty would have a tendency to augment the depth of the water in the channel close to the Washington shore from Three Tree Point, we will say, to Harrington Point.

A. It would.

Q. What, in your opinion, would be the natural course of the channel from Three Tree Point to Tongue Point if no artificial aids, jetties, dredging, or otherwise, obtained in the river?

290 A. The course of the water of the Columbia River from Three Tree Point to Tongue Point would practically be as indicated by the line in red marked on this exhibit as "1859 channel," passing down and through Woody Island channel to a point north of Tongue point.

Q. From your examination and observation of the maps, charts and reports as published by the government, are you familiar with the places in the Columbia River as shown on Washington's Exhibit I where dredging has been done? If so, kindly state.

A. I am informed that on the line marked "1905 channel" considerable dredging has been done.

Q. Do you know whether or not a jetty has been constructed by the government just west of the intersection of the blue line marked "Boundary line as claimed by Oregon" and the black line marked "1905 channel" as shown on Washington's Exhibit I?

A. I do not.

Mr. MACDONALD: I was under the impression that such a jetty had been constructed, but I am informed by Mr. Hegardt that it was merely a project and never was constructed.

Cross-examination.

By Senator FULTON:

Q. You have never been employed in any work on the Columbia River?

A. No, sir, except as consulting engineer of the State of Washington.

Q. In this case?

A. In this case.

Q. All you know about the physical conditions existing in the river during the period of time covered by your testimony, is what you have learned by an inspection of the maps and reading
291 reports of engineers who have been engaged in the work on the river, is it not?

A. Yes, sir.

Q. Your testimony, then, is simply an expression of your opinion and views after an examination of these records?

A. My testimony is the opinion that I gained after a thorough investigation of all the data of an engineering nature pertaining to the Columbia River from Three Tree Point down to and inclusive of its mouth.

Q. I ask you to answer the question yes or no.

(The question was read.)

A. Yes.

Q. Now, you spoke this morning of having had some experience as a civil engineer in locating the lines of some old lake, the name of which I have forgotten. Was it Ontario, or some lake antedating Ontario?

A. The lake formerly occupying the basin of the present Lake Ontario.

Q. How long were you thus engaged?

A. Six months.

Q. From that employment, to what did you go?

A. From that employment I drifted into work more geologic in its nature, taking in the history in a geologic sense, of the State of Florida for the United States Geologic Survey.

Q. You have never been employed in constructing jetties or other works designed to direct or control the flow of currents in rivers?

A. Not by the government.

Q. By whom have you been so employed?

A. By private corporations.

Q. To what particular works do you have reference?

A. The diverting of water for hydraulic purposes and the diverting of currents in the Clearwater River tributary to Snake, in the construction of wagon roads.

292 Q. Is the Clearwater a navigable stream?

A. It is not.

Q. You have had no experience, then, in the improvement of streams designed to increase their utility for purposes of navigation?

A. Not for purposes of navigation.

Q. Now, you speak of the ship channel in the Columbia River and the entrance thereto in 1839, 1851, 1854, and along in those years. On what do you base your statement that a certain line at a given period was the ship channel?

A. On the basis of the lines designated on the maps of 1851 and the maps of 1854.

Q. Simply on what was disclosed by the particular map concerning which you were testifying?

A. In reference to those dates.

Q. Take, for instance, the map of 1854; where was the ship channel at that time at the entrance to the Columbia River and up beyond Astoria?

A. In the map of 1854 the entrance to the channel designated on Washington's Exhibit H as the north channel in red, was at the point of intersection of the range lines Point Adams to Coxcomb Hill, and another range line on certain points on the Washington shore.

Q. What do you mean by saying that that was the entrance?

A. That was the entrance, in my opinion, to the north ship channel.

Q. That is, you mean to say that that was the entrance, or at that point a ship would be in the deepest water?

A. I mean to say by that, that that was the only point that you could get into the north channel.

Q. With what?

A. With a deep sea going ship.

293 Q. In 1854 what was a deep sea going ship?

A. 16, 18 or 20 feet, I suppose.

Q. Why do you say it was 18 or 20 feet in 1854?

A. The draught of all American ships was somewhere within those limits.

Q. In 1854?

A. In 1854.

Q. Was not an 18-foot vessel an exceptionally deep vessel in 1854?

A. It might have been an exceptionally deep vessel, but there may have been others that exceeded it in depth.

Q. Well, were there others drawing to exceed 18 feet of water in 1854?

A. I don't know of any particular instance.

Q. Now, coming to the Columbia River. Will you testify that there were vessels drawing 18 feet of water in 1854?

A. No, sir, I will not.

Q. Do you know any of the vessels that came to the Columbia River at that time?

A. I do not.

Q. Then, why do you make the statement that that was the only place a vessel could enter the Columbia River at that time?

A. For the reason that the north channel as there indicated is bounded both on the north and on the south by an area of sands, over which — was very much shallower than 18 feet. The outline

as shown there is an 18-foot curve. Within that very much shoaler areas occurred, so shallow in fact in places as not to exceed probably 6 or 8 feet.

Q. Is there anything on the 1854 map to indicate that there was anything less than 15 feet to the south of the curve which you say marks the 18-foot contour?

A. Not on the 1854 map.

Q. The tide rises not less than 7 feet there, does it not?

A. I understand that that is the rise of the tide.

294 Q. And sometimes higher?

A. Sometimes higher.

Q. So, at high tide, there would be at least 23 feet of water over what is indicated as the Middle Sands on the south of the entrance to what is marked the north ship channel?

A. Assuming that 15 feet is the least depth of water shown on those sands, either of record or otherwise.

Q. That would be a pretty good entrance for a ship drawing but 18 feet, would it not?

A. It would.

Q. In the map of 1851, I understand you to say that there are two separate channels—a north and a south channel—indicated in the Columbia River.

A. In the map of 1851 there are two channels indicated, the north and the south channels.

Q. That is Oregon's Exhibit No. 4, is it not?

A. Oregon's Exhibit No. 4.

Q. Now I ask you to indicate what you call the north ship channel in the Columbia River on Oregon's Exhibit No. 4, the map of 1851.

A. The north ship channel of the Columbia River on the map of 1851 extends from the figure "6" marked on the line designated as range of Point Adams and Coxcomb Hill, which I will designate as the entrance to the north channel, to and abreast of Cape Bluff in a northerly direction; then rounds Sulphur Spit in an easterly direction, taking up a more southerly course until Sand Island is passed, when it enters the Clatsop or main channel of the Columbia River.

Q. Thence where?

A. Easterly up the river.

Q. On which side of the river?

A. On the Oregon side of the river.

295 Q. Now, do you wish to be understood as saying that the north ship channel does not continue up along the north shore by Point Ellice?

A. There are no sailing directions on any of the maps in question which would designate that as being the case.

Q. In the absence of sailing directions it is immaterial what the depth of water is, in your judgment? There would be no channel.

A. There is a channel there.

Q. Just please answer my question.

(The preceding question is read.)

A. The mere absence of sailing directions would not, in my opinion, show that there was no channel along the Washington shore.

Q. Very well, then. Why did you answer my question by saying that the reason you stated the north channel did not continue up by Point Ellice was because there were no sailing directions?

A. I was describing the course taken by an incoming ship in going up the north channel around Sand Island to and up the river—to Astoria up the river.

Q. As a matter of fact, Oregon's Exhibit No. 4, map of 1851, shows a sufficient depth of water up along through the north channel by way of Point Ellice to accommodate any ship that floated in those days, does it not?

A. As far easterly as a point approximately 2 miles east of Point Ellice.

Q. Well, why do you say that the north ship channel terminates at the head of Sand Island?

A. The maps referred to do not give any sailing directions continuing up this channel beyond that point.

Q. You also testified this morning that the north ship
296 channel terminates absolutely (if I understood you correctly) at a point south of Point Gray as marked on the map of 1851, Oregon's Exhibit No. 4.

A. Which channel are you referring to—the Knappton channel or this other channel? (Pointing on the map.)

Q. I understood you to refer to the channel at the south of the channel that follows immediately the north shore from above Knappton.

A. That is right. I testified that it terminated at a point south of Point Gray.

Q. Why did you make that statement? On what do you base it?

A. On the official charts covering that particular portion of the channel's course.

Q. Does it not show a continuation of the channel up to a connection with deep water beyond, in the neighborhood of Three Tree Point?

A. It shows shallow water immediately south of Gray's Point and for a distance of 2 miles before again reaching water of any considerable depth.

Q. Is not the lowest or the shoalest water indicated at any place 11 feet?

A. Yes.

Q. That 11 feet is at low tide, is it not?

A. At low tide.

Q. And in that locality the tide rises 6 or 7 feet at least, does it not?

A. Yes.

Q. And do you think a channel terminates where it still has water not less than 11 feet at low tide, with a rise at high or flood tide of 6 or 7 feet?

A. For all practical navigating purposes, the 11 feet indicated

there as being the least water is one of the few places that is
297 not less than that. In other words, the channel would be very narrow even with that depth.

Q. The largest steamer that plies on the Columbia River outside of sea-going vessels could navigate that channel with perfect safety at all times, could it not?

A. I do not think so.

Q. What river steamer draws as much as 11 feet of water?

A. It is a question of river steamers, is it?

Q. Yes.

A. Why, a river steamer could navigate that channel.

Q. That is what I asked you.

A. I didn't understand it.

Q. Do you know what the ocean-going steamers that ply between Portland, Oregon, and San Francisco draw?

A. I suppose from 18 to 24 feet.

Q. On what do you base that?

A. I base that simply on having noticed depth marks on the steamers, having investigated it.

Q. Have you noticed any ship that goes to Portland with a mark of 24 feet on it?

A. I wouldn't recall any particular instances recently.

Q. Do you know of any ocean steamer or any steamer that plies between the Columbia River and San Francisco drawing as much as 20 feet of water? If so, state what one.

A. I do not know the particular draught of any of the boats.

Q. Then, you do not know as a matter of fact that the steamers that ply between the Columbia River and San Francisco could not navigate this channel at high tide.

A. The mere fact that they do not is conclusive proof to my mind that they could not.

Q. But personally you do not know that they do not, do
298 you?

A. I have been on a good many of them, but I have never gone around that way.

Q. The mere fact that they would take the deepest channel that they could find would not be proof that they could not navigate some other channel in the absence of the existence of that deeper channel, would it?

A. The probabilities are that they would navigate the safe channel.

Q. The probabilities are they would navigate the deepest and best channel they could find?

A. The safest channel, which would be the deepest.

Q. That would not indicate, would it, that they could not navigate another channel?

A. Not at all.

Q. That might be there, in the absence of this deeper channel?

A. Not at all.

Q. Then you simply say that that channel terminates below

Point Gray because, in your judgment, there are deeper channels elsewhere?

A. The deep water of that channel terminates at a point south of Point Gray.

Q. And opens again where?

A. Opens again about 2 miles to the east of that.

Q. Then, do you think you are justified in saying that the channel terminates at that point when it is simply a shoal still carrying 11 feet of water at low tide and opens again at 2 miles in very deep water?

A. I am.

Q. Don't you think it will be more accurate to say simply that there is a shoal place in it for that distance?

A. Well, for all practical purposes it terminates there.

Q. But it does not terminate there for a vessel that is drawing 10 or 11 feet of water?

299 A. There is no map of record that I can find that shows there has ever been continuous water between Gray's Point and the deep water to the east, referred to.

Q. What map shows that there ever has been continuous deep water along the line that you have marked as the "1905 channel," except one secured by dredging?

A. The channel shown and indicated in black on Washington's Exhibit H is through the deepest water known between the whistling buoy and Tongue Point. After leaving Tongue Point, or after leaving a point westerly of Tongue Point and trending over to Harrington Point it traverses a portion of the river which has been rendered deep enough by the means of dredging.

Q. Then, without that dredging you would say that that channel had terminated at Tongue Point, would you not?

A. I would.

Q. Now this channel concerning which I have been interrogating you, which you have stated terminated at a point below Point Gray, is shown on the map of 1851, Oregon's Exhibit No. 4, is it not?

A. Yes.

Q. It is not what you would call the north channel of the Columbia River, is it?

A. No sir.

Q. It is not what you would call the south channel, is it?

A. No sir.

Q. It would be properly indicated, then, as the middle channel, would it not, or channel between the north and south channels?

A. Yes sir. In a cross-section of the river on a line north of Astoria there would be three channels: the northern branch going up towards Knappton, a middle branch (which we have discussed), and a south channel on the map of 1851.

300 Q. Now, if you were directed to start from a point one marine league west and opposite the middle of the north ship channel of the Columbia River, and thence easterly to the middle of the Columbia River, to what channel other than this channel which we are discussing could you logically run?

A. If what you have indicated as the middle channel were a continuous channel passing up the river, instead of a channel interrupted by extensive shoals (as shown by the data recorded in map form), I would say that a course such as outlined by you would lead you from the mouth of the north ship channel, as defined in my former answer, to and up the channel designated by you as being the middle channel.

Q. And the one which you said terminated at a point south of Point Gray?

A. Terminated at a point south of Point Gray.

Q. And the only thing that leads you to believe that could not have been meant is the existence of these shoals?

A. Yes.

Q. For about two miles, that you have described.

A. Yes, for about 2 miles.

Q. You spoke of the ruling depth of water immediately opposite Astoria as being 59 feet. While I do not understand that that is material I would be pleased to know what you term the ruling depth in that connection.

A. Immediately opposite Astoria the depths given by me are those shown on Washington's Exhibit H, on the line lettered as "Astor Point."

Q. Well, that is the extreme depth found in the harbor, is it not?

A. It is.

Q. And it is practically opposite the middle of the town?

A. It is.

Q. In speaking of the ruling depth of channels otherwise, why do you give the least depth found in the channel, and when I
301 ask the ruling depth opposite Astoria, give the extreme depth?

A. I believe that in my testimony this morning I gave all of the depths abreast of the limits of the town of Astoria.

Q. Subsequent to the answer in which you gave the ruling depth as 59 feet?

A. Subsequent to that, yes.

Q. 59 feet would not be the ruling depth in that harbor, would it?

A. No sir.

Q. The least depth would be the ruling depth for a ship navigating the harbor?

A. Yes.

Q. Now you speak of the anchorage grounds that are marked at different places. What do you understand that those markings indicate?

A. Favorable places for anchorage placed in navigable waters.

Q. It does not mean that those are the only secure places for anchorage, but simply that they are secure?

A. Simply that they are secure.

Q. Such marking does not really indicate anything in regard to the channels of the river?

A. Except that they are placed in the navigable portions of the river.

Q. Yes, placed in nagivable portions, but usually not on the regular highway or deepest part of streams?

A. No sir.

Q. Usually to one side, in order not to be in the track of vessels?

A. Yes sir.

Q. You stated that you knew as a matter of fact that the dredging prosecuted in the Columbia River by The Port of Portland
302 was under the control and regulation of the Federal government at least I so understood you to state. Is that what you testified to?

A. That it was in accordance with a project of the Federal government.

Q. You did not mean to say that it was under the supervision of the Federal government?

A. I understood that it was under the supervision of the Federal government?

Q. From whence did you secure such information?

A. There is no special record that I secured that from; simply hearsay.

Q. It may be, then, for aught you know, that that dredging prosecuted by The Port of Portland was done without the supervision or any regulative control being exercised by the Federal government?

A. Yes sir.

Q. As a matter of fact it is your understanding, is it not, that this dredging was prosecuted by The Port of Portland and the expenses defrayed by it from taxes levied by the municipality of The Port of Portland for that purpose?

Mr. MACDONALD: That is objected to as irrelevant, incompetent and immaterial. Official documents now in evidence in this case show that this dredging was done by The Port of Portland under the supervision of the Engineering Department of the U. S. Army.

A. I am not familiar with the financial arrangements made for the prosecution of this work.

Senator FULTON: The counsel for the State of Washington causes to be entered in the record the statement that record testimony heretofore introduced shows that this work was prosecuted under the direction of and pursuant to the projects of the Federal government; but the question that I ask is from what source came the
303 funds to defray the expenses and who immediately prosecuted the work. As to that you do not know?

WITNESS: I have answered that.

Q. You say that the Columbia is a silt-bearing stream?

A. Yes.

Q. That is only during short periods of each year, is it not?

A. Yes sir.

Q. As a matter of fact, the Columbia River bears less silt than any other of the large rivers of this continent, does it not?

A. I have not made any investigations into the records of the silt-

bearing ability of the other streams, and therefore cannot make a comparative answer. It carries less silt than does the Mississippi River.

By Attorney General CRAWFORD:

Q. When you were speaking of Sand Island and the Middle Sands, you referred to Sand Island as being sands which were uncovered at low water, did you not?

A. At one period of the existence of Sand Island, it was covered with water. Then it emerged above low water and is so at the present date.

Q. I wish to call your attention to the fact that apparently on some of the earlier maps from which you have testified Sand Island appears to be surrounded by what you would term the Middle Sands, does it not?

A. It formed in the early period of its existence an integral part of what is designated on these maps as the Middle Sands.

Q. Then in a portion of your testimony, in referring to Sand Island, you referred to a portion of the Middle Sands?

A. To that portion bare at low water.

Q. That is what you denominated as Sand Island?

304 A. As Sand Island.

Q. And the portion that was not bare at low water you designated the Middle Sands?

A. The Middle Sands.

By Senator FULTON:

Q. You spoke about the construction of that jetty in the Cordell channel as having the effect of throwing the current in greater volume and, I suppose, force, down the north channel.

A. That was not exactly my statement. My statement was that that jetty had the effect of splitting or dividing the waters of the Columbia River, and throwing a large portion towards the north shore which would otherwise pass into the Woody Island channel.

Q. Well, that would be to increase the volume down the north side?

A. Down the north side, yes.

Q. But what I desired to ask you was this: Was that the purpose for which the jetty was constructed?

A. That was not the purpose for which the jetty was constructed.

Q. The object in constructing that jetty was to increase the depth of the water in the Woody Island channel, was it not?

A. Yes sir.

Q. You speak of the effect that it did have based on the results that followed, I assume?

A. Based on the results that followed.

Q. Now, the result to which you refer is the continued shoaling or at least a failure to increase the depth in the Woody Island channel?

A. A continued shoaling of Woody Island channel.

Q. Had not the Woody Island channel been shoaling before?

305 A. It had.

Q. They would not have built the jetty had it not been shoaling, would they?

A. That is right.

Q. How do you know that it was the construction of the jetty that caused its continued shoaling?

A. The construction of the jetty augmented the shoaling.

Q. How do you know that?

A. For the reason that the depth of water decreased more rapidly.

Q. It had been shoaling before, had it not?

A. It had.

Re-direct examination.

By Mr. MACDONALD:

Q. The building of the Snag Island jetty effectually obliterated the Cordell channel, did it not?

A. It did.

Q. I desire to call your attention again to Washington's Exhibit H, particularly the hydrography of 1854, immediately north of the north channel line; and I desire to ask you if it is not a fact that this survey indicates that much less than 18 feet existed over these spits by the fact that no soundings are given over this spit, and that the word "breakers" is written along the edges of the 18-foot contour lines?

A. The word "breakers" is written in other places than the area outlined in red and filled in in orange—twice on the western boundary of this area, and in another place near the center on the eastern line.

Q. You may state whether or not constant breakers exist upon those sands or spits just north of the north ship channel, as shown by the hydrography of 1854.

A. In the body of the map of 1854 there is no statement to

306 that effect.

Q. Well, assuming that constant breakers exist there, would it be practicable for deep sea going vessels to pass over shoals where such breakers exist?

A. No.

Q. I believe Senator Fulton interrogated you with reference to the 1905 channel line as shown on Exhibit I; and in answer to his questions you stated that that channel line had not been maintained for navigable purposes except by dredging. I desire now to inquire of you whether or not, so far as you have been able to gather, the 1859 channel line as marked in red on Washington's Exhibit I was maintained for navigable purposes by dredging.

A. Not to my knowledge.

Q. From your examination of the records and maps, is there anything to indicate or show that dredging has been had in that 1859 channel to maintain it as a ship channel?

A. No.

Recross examination.

By Senator FULTON:

Q. By the 1859 channel do you have reference to the Woody Island channel?

A. It is marked on the map in red and designated as the Woody Island channel; it is further marked with the year, 1859.

Q. Does not constant use of the channel by steamboats tend to increase its depth?

A. Yes sir.

Q. That is particularly true where sternwheel or paddle boats, as distinguished from screw-driven boats, are employed, is it not?

A. I have never made any investigation as to the relative ability of sternwheel boats of a river type and propeller steamers to
307 agitate the sand.

Q. From your knowledge as a civil engineer would you not say as a matter of fact that the large wheel employed on what are termed sternwheel boats would tend more largely to agitate the sand than the screw used on a propeller?

A. I should think not; I should think that the action of the sternwheel would be more superficial in its nature than that of the screw or propeller.

Q. Have you ever observed which agitates the water more widely,—the sternwheeler or the propeller?

A. The sternwheeler makes considerable more surface agitation than the screw does.

Q. In either event, the employment of steamboats regularly in a channel tends to deepen it?

A. Yes sir.

Q. Do you know what type of steamer has been most largely employed on the Columbia River since it has been used as a navigable water?

A. Nothing more than in a general way; probably sailing vessels, present-day steamers of the propeller type, and the ordinary river boats.

Q. As a rule, the ocean-going steamers are of the propeller type, are they not?

A. Yes sir.

Q. Many of the river boats, so-called—having reference to those that are used exclusively within the river—are stern-wheelers, are they not?

A. Yes sir.

By Attorney-General CRAWFORD:

Q. It is a fact, is it not, that breakers frequently appear in case of storms where at other times the water is comparatively smooth or just the ordinary billows of the ocean appear?

A. Breakers are generally an indication of shallow water,
308 and are more severe in case of storms than in quiet weather.

Q. Do not the billows of the ocean break more in deeper water in a storm than they do at other times?

A. Yes sir.
Q. And much deeper, too?
A. I don't know how much deeper.
Q. Frequently do breakers appear clear across the mouth of the Columbia River, do they not?
A. I have never seen them clear across the mouth of the Columbia River, personally.
Q. No, but you have heard of their doing so?
A. I don't know as I have ever had any knowledge of that particular condition of affairs.
Q. You have no knowledge then, of the operation or appearance of breakers on bars of the Pacific Ocean, have you?
A. I have seen breakers on bars of the Pacific Ocean.
Q. Yes, but I mean during storms—heavy storms.
A. During weather such as today.
Q. Is this a stormy day?
A. No sir.
Q. It is a very calm day, is it not?
A. It is calm.
Q. You never have observed the operation or action of breakers on this bar or any other bar of the Pacific Ocean during a heavy storm, have you?
A. Yes sir.
Q. At what time?
A. I don't know any particular case. I have made a good many trips down the coast.
Q. What bar?
A. On the Columbia River bar and going down towards Los Angeles.

309 Q. Your view-point was from a position on board ship on the ocean, then?
A. On board ship out on the ocean.

Q. When you would be passing the mouth of the Columbia river on board of a ship?
A. Yes sir.
Q. Bound either from Seattle to San Francisco or vice-versa?
A. Any coast point.
Q. But not from any view point near the bar?
A. Not from any view-point on the main land.
Q. You may state then if breakers do not, within your knowledge, procured either by personal observation or from talking with seafaring men, sometimes break directly across the bars of nearly all Pacific Coast harbors during heavy storms?
A. I can imagine storm conditions in which breakers would break clear across the mouth of the river.
Q. And when the storm has cleared and these breakers subside, ships engaged in commerce would proceed along the channel just the same as prior, would they not?
A. Yes.
Q. Then, the fact that breakers sometimes occur does not of itself indicate that that part of the ocean or bar is non-navigable at all times, does it?

A. The fact that breakers sometimes form across the mouth of a river is no indication that the stream as a stream cannot at certain stages be navigated, no; but it is an indication, in the absence of storm conditions, that the water is shallower than it would be in the channel of the river.

Q. Or in the ocean where it is deeper?

A. I didn't understand that.

Q. I say in the ocean where the water is deeper?

A. Are you completing my sentence?

Q. I am asking you another question.

310 A. I don't get the drift of it.

(The last two questions and answers were read.)

WITNESS: I suppose if the ocean is deeper at that part it is an indication that—it is deeper.

Q. Now, did you ever see the breakers rolling up the Columbia River from the ocean?

A. I have seen breakers in the estuary of the Columbia River, yes, sir.

Q. Close at the mouth?

A. Yes, sir.

Q. When waters become confined by banks, it is almost impossible, unless it is a large lake, for the winds to create waves large enough to have breakers, is it not?

A. Well, if the lake is not large enough to permit the wind to get access to the water, I suppose there isn't any possibility of breakers.

Q. And the Columbia River is one of those streams that is so narrow that the wind can't get that access?

A. You refer to a point above Three Tree Point?

Q. Above the bar.

A. Above Three Tree Point?

Q. Yes, or from Three Tree Point to Astoria.

A. The estuary of the Columbia River is as large as a good-sized lake, and under storm conditions there is a possibility of creating breakers, more particularly along the shallow tracts.

Q. But not breakers sufficiently large to be dangerous to navigation?

A. They are not as large as would form over the bar, no.

Q. And they could not be considered as a danger to navigation?

A. Not within the channel limits.

Q. Then, breakers that are dangerous to navigation must occur at the mouth of the Columbia River, at least near the place where the water of the Columbia River enters into the ocean or

311 westward of it, must they not?

A. Where the breakers are dangerous is at shallow portions of the river's mouth. Within the channel limits themselves, unless excessive in height, I imagine the danger they would cause would be very small.

Q. Then the fact that these breakers that you mention on these maps are there, is not an indication that that portion of the channel,

or where the waters run north from the north channel of the Columbia River is non-navigable, is it?

A. They indicate to me that the places marked and designated on that map as the 18-foot contour line and further designated by "breakers" are a shallow portion of the river's mouth; that breakers are more liable to form there than they are in the channel portion of the river.

Q. There is a portion westward from Cape Disappointment, is there not, where there is nothing to show breakers at all, in going out in the north channel on a westerly or northwesterly course?

A. What map are you referring to?

Q. Prior to 1851.

A. Directly west of Cape Disappointment there is no channel as indicated by any soundings on that map.

Q. No; and there is nothing to show that there is not, is there?

A. There are no soundings on the map in question to designate it. Yes, there are, too; I will take that back. Immediately south, and extending 2 miles in a southerly direction, are contour lines indicating curves of 18-foot depths. Within these is given a depth of 11¾ feet, which is materially less than any depth shown within the limits and confines of what is on that map designated as the north channel.

312 Mr. MACDONALD: What map is that?

WITNESS: Oregon's Exhibit No. 4, 1851. This line is further designated by the word "breakers." Parallel to this line is another line marked as the "24-foot line" and further designated as "Line of breakers in heavy weather."

Q. And directly outside of that is marked 4¾, 5¾, 6¼, and so on, fathoms, is there not?

A. Yes, sir.

By Mr. MACDONALD:

Q. I wish you would take the map showing the hydrography of 1852 (I think it was published in 1854), Oregon's Exhibit 5, and tell us what breakers are shown by the hydrography of 1852 in the immediate vicinity of Cape Disappointment, towards the west.

A. Immediately south and over the "No. 10" indicated on the map in question, the word "breakers" appears.

Q. How many times?

A. Near that particular figure, once. Southeast from there, near the figures "3½," the word again appears; almost due west from there, near the figure "4½," it again appears.

Q. Do any of the breakers appear to be shown south of those you have just enumerated and north of the north channel line?

A. The word "breakers" appears south of those enumerated within the 18-foot contour line enclosing the words "Peacock Spit," continuing south, forming the north confine of the north channel and then following a generally northerly direction.

Q. Now take up the sands or spits intermediate of the north channel line and the south channel line as disclosed by the map of

1854, and tell us what breakers are delineated upon that map between those points.

313 A. The area intermediate between the south and the north channel lines and designated as the Middle Sands in my testimony of this morning, shows the word "breakers" following the 18-foot contour line in a great many places.

Q. They are all marked on the map, are they?

A. They are all marked on the map.

Q. In your testimony, or in that of Engineer Hegardt, frequent mention was had of the expression "inside of 18-foot (or other) contour lines." When you speak of "inside a contour line," do you mean in the direction of the shore or land?

A. No, inside the contour line, as I use the expression, are elevations less than those designated by the contour line, whether 12 or 18 or 24 foot contour lines.

Q. Let us take the Middle Sands, which you have just been testifying to. What contour line runs on those?

A. 18-foot contour line.

Q. When you speak of inside of those contour lines, you mean inside from the water to the middle of the sands?

A. The contour line itself follows the points equal in depth. Within the area enclosed by that line there appear other soundings, such as 15 feet, 16 feet, 17 feet, all being less in depth than the depths covered by the 18-foot contour line.

Q. Do you think that the passage of steamers has had a tendency to deepen and widen the channel passing through or north of Sand Island during the last few years?

A. I am hardly judge of that. But the mere fact that the channel has shoaled so that it is not navigable for deep sea going vessels would indicate that the effect of the passage of the present river boats—that is, on the movement of the sands—was not as great as sometimes accredited to it.

Q. The effect has probably been imperceptible.

A. Imperceptible.

314 By Senator FULTON:

Q. Wouldn't it be an indication that, notwithstanding the beneficial effect of navigation of the channel by boats, the opposing forces shallowed the channel?

A. The opposing forces were evidently greater in their effects than the action of the steamers.

Q. And that is simply all that proves, is it not?

A. That is all that proves. I simply made the statement that they were not great enough to overcome that.

Q. You speak of these 18-foot contour lines and what they indicate. I am not sure that I understand you correctly. I ask if it does not indicate that within the 18-foot contour lines there is no less depth of water than 18 feet.

A. It does not. It indicates that there are less depths within that line.

Q. It means, then, that there are less depths than 18 feet?

A. Within the area enclosed within the 18-foot contour lines.
Q. That there are less depths than 18 feet?
A. Less than 18 feet.

By Mr. MACDONALD:

Q. Then, as I understand it, Mr. Jussen, within 18-foot contour lines, depths may be less, but not more, than 18 feet?
A. That is right.

Excused.

315 G. B. HEGARDT recalled as a witness on behalf of the complainant, testified as follows:

Direct examination.

By Mr. MACDONALD:

Q. I understood you to say in your former testimony, Mr. Hegardt, that the survey and measurement of the Columbia River entrance were made either by you or under your direction.
A. Since 1888.
Q. I believe the hydrography of Washington's Exhibit H was made between 1868 and 1899 as shown upon this map, Washington's Exhibit H, and the hydrography of the entrance was from a survey by the corps of Engineers, U. S. A., October, 1905. I will ask you whether or not of your own knowledge you know the hydrography as platted upon this map to be correct.
A. It is correct.
Q. I wish that you would explain the method and manner in which these various charts, for example, Washington's Exhibit H, are made.
A. On the various high lines or prominent points there are beacons or triangulation stations established to which sextant angles are taken from the steamer with which the survey is made. In taking these soundings, the condition of the ocean is always very smooth and the tide gauge is constantly read so as to know the stage of the tides at that particular time when the soundings are taken, and as a rule every fifth sounding is located by sextant so as to definitely determine its location on the map. When surveys are made these maps are platted, and the maps of the survey are then forwarded to Washington, to the Coast and Geodetic Survey, through the Chief of Engineers, and incorporated in the regular surveys and charts published by that department.

316 Q. You may state whether or not Washington's Exhibit H, as it came from the office of the Coast and Geodetic Survey, and before the various lines and other colorings appearing thereon now were placed thereon, correctly reflected the surveys made by you or under your direction in 1889 and of the entrance of 1905.
A. That is, the hydrography?
Q. Yes, sir.
A. Not the topography?

Q. No, sir, just the hydrography.

A. All the soundings shown on there were taken during my time, that is, the surveys.

Q. And you know them to be correct of your own knowledge?

A. Yes, sir.

Q. Considerable reference was made this afternoon to the dredging or construction of the jetty on Snag Island or near Snag Island by The Port of Portland Commission. I wish you would state the facts with reference to how that work was done and under what supervision, if any.

A. That Snag Island jetty was constructed by The Port of Portland — under the supervision of the United States Engineer Department, under authority of the Secretary of War.

Q. You may state whether or not that work was so done in furtherance of the project evolved by the Federal government or its officers.

A. That Snag Island jetty was constructed in accordance with Major Handbury's project of 1891.

Q. Was Major Handbury, the officer who was in charge of this district, an officer of the Corps of Engineers of the United States Army?

A. Yes, at that time.

Q. I desire to inquire of you how far up the river you have seen breakers.

A. When I first took charge of the jetty work at Fort
317 Stevens, the breakers in ordinary and extraordinary storms came up as far as Desdemona Sands—very heavy breakers, too.

Q. You may state what effect, if any, the construction of the Fort Stevens jetty has had upon the encroachment of breakers up the river.

A. The breakers up the river have ceased since the construction and extension of the present jetty.

No cross examination.

Stipulation.

It is hereby stipulated by and between the parties hereto that Linck C. Burton, Deputy Fish Commissioner of the State of Washington, if called to the stand, would testify substantially the same as did T. R. Kershaw, a witness called on behalf of the State of Washington.

And it is further stipulated for the purposes of this case that Mr. Burton was called and did so testify, subject to all objections as to competency, materiality and relevancy. But this does not preclude the State of Oregon from questioning the correctness of the testimony of either T. R. Kershaw or Linck C. Burton.

The hearing thereupon adjourned until Tuesday, July 24, 1906, at Portland, Oregon.

318 HOTEL PORTLAND,
PORTLAND, OREGON, *July* 24, 1906.

At the above place and date the taking of testimony was resumed before the Commissioners, at ten o'clock A. M.

Present: The Commissioners; E. C. Macdonald on behalf of the State of Washington, Attorney-General Crawford, Senator Fulton and Harrison Allen, District Attorney, 5th Judicial District, Oregon, on behalf of the State of Oregon; and Robert S. Taylor, the shorthand reporter.

E. W. Ross was recalled as a witness on behalf of the State of Washington, and testified as follows:

Direct examination,

By Mr. MACDONALD:

Q. The other day when you were upon the stand on behalf of the State of Washington, Mr. Ross, you were asked concerning certain applications which were made for the leasing or purchasing of portions of Desdemona Sands. I will ask you if during the recess you have made an examination of the official records in your office as Commissioner of Public Lands for the purpose of determining just what applications were made to the State of Washington.

A. I have.

Q. I should be glad to have you submit them to me.

Witness produces papers.

Mr. MACDONALD: I desire to state to the counsel that we have the original documents here. I should be glad to have you examine them and then let Mr. Ross testify to the substance thereof. Of course we cannot introduce these in evidence, and I doubt
319 whether copies even would be of any material benefit. I think the substance can be stated in a few words.

The papers produced by the witness were handed to counsel for the State of Oregon, and Senator Fulton stated that the State of Oregon had no objection.

Mr. MACDONALD: If you feel that you need any copies of them we will furnish you certified copies, but I prefer not to put them in because they would encumber the record.

WITNESS: I could not let go of these original papers.

Q. Mr. Ross, I wish you would state from the official documents or records in your hands just what applications were made for the leasing or purchasing of Desdemona Sands, by whom, the date, and all the particulars.

A. The first application for Desdemona Sands was made by B. F. Houston; application No. 3846, filed in the office of the Commissioner of Public Lands of the State of Washington April 14, 1904. When I was on the stand some days ago, my recollection was not so very clear, when Senator Fulton asked me some questions; and I find that the entire transaction was closed before the beginning of

my term and the contract of sale actually issued to Mr. Houston. The final order of the Board of State Land Commissioners was made on the 28th day of December, 1904, entered at page 164 of Vol. 19 of the minutes of the Board, and reads as follows (leaving out the description of the lands): "In the Matter of the Application for the Purchase of Second-class Detached Tide-lands in Pacific County, by B. F. Houston of Tacoma, and the application of W. H. Barker for the Purchase of Detached Tide-lands in Pacific County, No. 3901, this matter coming on for hearing on this 28th day of December 1904, and it appearing that the two applications conflict as to the land applied for, and it also appearing that the application
320 of B. F. Houston is the prior application, and that he therefore has a prior right to application for said detached tide-lands; it was, therefore, ordered that upon payment of the appraised value thereof said application be approved and contract of deed issued to said applicant. It was also ordered that the application of W. H. Barker be cancelled." That leaves out the description of the land so far as the order is concerned. The contract of sale was issued to B. F. Houston on January 6, 1905, a few days before my term of office began.

Q. Is that contract in force and effect at the present time?

A. It is, yes sir.

Q. Have all payments required by the terms of that contract been made unto the State?

A. All payments that are due.

Q. I mean, all payments that are due.

A. Yes. Do you wish to have portions of the contract read, Mr. Macdonald?

Mr. MACDONALD: It might be well.

A. The sale was in consideration of the sum of $531.40. The sum of $53.14 was paid at the time of the execution of the contract expressed therein and the receipt of that sum is acknowledged in the contract. "The remainder of the purchase price according to the terms of the contract is to be paid in nine equal annual installments, with interest at six per cent. on all deferred payments.

Q. What is the acreage of that tract?

A. 106.25 acres.

Q. I understood you to testify the other day that the minimum price at which this land was sold was $5 an acre.

A. Yes, $5 an acre. I think Senator Fulton asked me
321 about a protest.

Q. Yes; I desire to inquire whether or not any official or other protests were filed in the office of the Commissioner of Public Lands,—protesting against the leasing or sale by the State of Washington of Desdemona Sands.

A. I made diligent search among the records of the office to find a trace of a protest on the part of the State of Oregon or an officer of the State of Oregon, or anything in the nature of an official protest, and I also had a number of the clerks in the office make search. Some of them were in the office at the time these transactions took place. We have been unable to find any trace of any official protest

on the part of the State of Oregon or any officer of the State of Oregon. I do find, however, that a protest was made against this sale by the Columbia River Packers Association of Astoria.

Q. I wish you would briefly recite the contents of that protest, giving the date of it and the time it was received at the office of the Commissioner of Public Lands for filing and the date of the filing.

A. I cannot inform you as to the date on which the protest was filed in the office of the Commissioner of Public Lands, for this reason: the record shows the original protest to have been withdrawn and returned.

Q. To whom was it returned?

A. There is a letter in the record here, or a copy of a letter, signed by the Secretary of the Board of State Land Commissioners, which recites that it is herewith returned, and the letter is addressed to Fulton Bros., as attorneys for the Columbia River Packers Association, at Astoria, Oregon.

Q. Now, I wish you would be good enough to give us, in substance, the terms of that protest as filed by the Columbia
322 River Packers Association.

A. This is from a copy I find substituted in the records of what purports to be a copy: "To the Honorable Commissioner of Public Lands of the State of Washington"——

Q. Just state the substance of the letter.

A. The first ground of protest is that the whole tract applied for is within the territory and boundary of the State of Oregon and that no part or portion of it lies within the State of Washington. The Packers Association has protested on the ground that it has acquired by patent duly issued by the State of Oregon, under and pursuant to the statutes and laws of such state, legal title to the whole premises included in the application of Mr. Houston, and that that company claims to be the owner of valuable improvements situated on the tract of land. The fourth ground of protest set forth is: "The protestant is and its grantors have been for over six years last past in the open, notorious, adverse and exclusive possession of the whole tract." The document also recites that a copy of the patent from the State of Oregon, as I understand it, is attached, marked Exhibit A. I do not find it, however, attached to this copy of the protest.

Q. I understood you to say that that protest as disclosed by the records in your office was subsequently withdrawn and returned to the counsel for the protestant?

A. Yes.

Q. Let me inquire what is the date, if you know, of the last payment made on the Houston contract for Desdemona Sands.

A. I didn't think to look at the collection register to see whether the payment that fell due the 1st day of March last had been paid, but I know the contract has not been cancelled.

Q. You may state whether or not any other protests were filed.

A. There was a subsequent application; that is, an appli-
323 cation filed subsequent to the filing of the application of B. F. Houston. It was application numbered 3901, by William H. Barker of Astoria, Oregon.

Q. Just give us briefly the substance of that application, such as you have done with the Houston application.

A. The date of the filing of the application is a little dim on the back; I think it is September 17, 1904. The application is under oath and gives Mr. Barker's residence, that is his post office, as Astoria, Clatsop County, Oregon. It was sworn to on the 15th day of September, 1904.

Q. I wish you would recite briefly what that application contains. I understand it is on a printed form prepared by the State of Washington, is it?

A. Yes, it is a printed form. At the beginning of the document it is addressed to the Commissioner of Public Lands, Olympia, Washington. "I, William H. Barker, of Astoria, County of Clatsop, State of Oregon, do hereby apply to purchase that certain tract of tide lands situated in Pacific County, Washington, and particularly described as follows." Then follows a description of the land; then certain matters that I think would not be material to this controversy, follow.

Q. You may state what action, if any, was taken by the Commissioner of Public Lands upon that application and what its present status is.

A. That is shown in the order of the Board of State Land Commissioners which I read a moment ago.

Q. This is the application which was referred to in that order?

A. Yes, that is the application; and it is cancelled by order of the Board.

Q. Was any appeal taken from the order of cancellation?

A. Not according to my records, no.

324 Q. Are there any other applications for portions of Desdemona Sands?

A. I am not certain as to the tract purchased by D. H. Welch under application numbered 3792, but the tract is shown on Washington's Exhibit K.

Q. Is that the tract of land just east of Desdemona Sands, on Washington's Exhibit K and marked "D. H. Welch" contract?

A. That is the tract, yes sir.

Q. I wish you would recite briefly the particulars of that application, what action was taken, and its present status.

A. The application was filed in the office of the Commissioner December 30, 1903, accompanied by the field notes of the survey and the plat or map; the fact that the filing of the application (as in the other cases I have mentioned) was published in the Chinook Observer, a weekly newspaper published and of general circulation in Pacific County, Washington, for five consecutive weeks, commencing on the 22nd day of January, 1904, and ending on the 19th day of February, 1904. I have the proof of publication here if you wish to examine it or have any of it read. No protests were filed in this case.

Senator FULTON: That is the Welch application you are speaking of?

WITNESS: That is the Welch application, yes. The contract of

sale in this case was issued on March 7, or under date of March 7, 1904; it was in good standing, and the records of the office so show.

Q. By "good standing," do you mean that all installments due under the terms of the contract have been paid?

A. Yes. The order of the Board of State Land Commissioners in that case is found at page 198 of Volume 18 of the Minutes of the Board, and, leaving out the description, reads as follows: "In
325 the matter of application numbered 3792 by D. H. Welch for purchase of second class tide lands, detached, Pacific County, the said matter coming on for hearing on this date and it appearing that the application has been duly advertised and that no protests have been filed thereto, it was ordered that upon payment of the appraised valuation as appraised by law at $5 per acre, a deed issue from the state to said applicant for the lands described in said application." Then follow the description of the land by metes and bounds. I also examined (because of something said by Senator Fulton in one of his questions) the records with reference to the applications for the purchase of lands on Sand Island.

Q. I wish you would give us briefly the facts with reference to them.

A. Well, the applications are as indicated on the map.

Q. You may read off the names and the dates that the applications were filed in your office.

A. The name of the applicant and the number of the application are shown on Washington's Exhibit K. Application 4197, by B. F. Houston, was filed November 6, 1905; application 3879, by John D. McGowan, was filed August 1, 1904; application 3875, by B. F. Houston, was filed July 21, 1904; application 3881, by E. P. Noonan & Company, was filed August 8, 1904; and application 3893, by R. A. Hawkins, was filed August 29, 1904. These applications are all made on blank forms prescribed by the Board of State Land Commissioners of Washington, and are accompanied by plats and field notes of the survey.

Q. They were received and filed in your office, were they not?

A. Received and filed in the office, as stated.

Q. Did the statutory payment, on application being made, accompany each application?

A. Each application was accompanied with the statutory
326 amount required to be deposited with the application.

Q. And that money was received and retained by the State of Washington, was it?

A. Yes; it is now in possession of the Commissioner of Public Lands.

Cross-examination.

By Attorney General CRAWFORD:

Q. The applications made in April, 1904, are the earliest applications made to your state for any part of Desdemona Sands?

A. Yes, I believe so. That is, I am not certain as to the date you

mention, April 1904, but the applications I have here and have testified about are the earliest, as far as my records show.

Q. And the only ones shown by your records?

A. Yes.

Q. As I understood your direct testimony, you stated that the Columbia River Packers Association claimed in their protest that Desdemona Sands were entirely within the jurisdiction and sovereignty of Oregon?

A. Yes sir.

Q. And also that they had a prior conveyance for them from the State of Oregon?

A. Yes; that is set forth in the protest.

Q. And as to Sand Island; the applications to which you have testified are the earliest and only applications ever made to your state for any part of Sand Island, are they not?

A. Yes sir.

Q. And those earliest ones were August, 1904?

A. I think so. The dates as I gave them a few moments ago are correct.

Q. You may state whether the State of Washington has
327 ever issued any contract of sale upon those applications.

A. None have been issued up to date.

Q. Upon any portion of them?

A. Upon any portion of the applications on Sand Island.

Mr. MACDONALD: Are you referring to Sand Island or to Desdemona Sands?

Mr. CRAWFORD: Sand Island.

Substitution of Washington's Exhibit H for Washington's Exhibit A for Identification.

Mr. MACDONALD: Upon the taking of the testimony at Astoria, I introduced in evidence the map which was then marked Washington's Exhibit A, for identification, and I directed the attention of certain witnesses for the defendant thereto. I then stated that I would like to substitute another map for that map. I don't know whether the record shows that or not. For Washington's Exhibit A for identification I should like to identify Washington's Exhibit H, which is an exact reproduction of it, the only difference being that Exhibit H is certified to by the assistant secretary of the Department of Commerce and Labor and the other one was uncertified. I would like to withdraw Washington's Exhibit A for identification and substitute Exhibit H and let it be considered as the one referred to by the witnesses.

328 Attorney General CRAWFORD: Exhibit H is the composite map?

Mr. MACDONALD: Yes.

Attorney General CRAWFORD: The State of Oregon has no objection to the substitution.

(On Thursday, July 26, 1906, after testimony on behalf of the

defendant by witnesses G. G. Brown, H. G. Van Dusen, John H. Lewis, W. Hampton Smith, had been introduced, the State of Washington recalled and examined G. B. Hegardt, as follows.)

G. B. HEGARDT recalled as a witness on behalf of the State of Washington, testified as follows:

Direct examination.

By Mr. MACDONALD:

Q. You are the same Mr. Hegardt who heretofore has been sworn and testified in this case?

A. I am.

Q. I desire to call your attention to the bar channels of 1854 and ask you which is the better channel of the two. You may examine Washington's Exhibit H. Which of those two channels is the better one for navigation and which is the natural channel?

A. The depth of water at entrance of both channels, that is, the north channel and the south channel, is the same. According to the sailing directions the south channel is the better and safer channel.

Q. Why?

A. It is more direct, and it is not subject to cross currents or baffling winds.

329 Q. What is the direction of the ebb in the waters or currents as they leave the gorge of the river?

A. They pass into the ocean in a southwest direction.

Q. I wish you would define the term gorge or throat of a channel.

A. The gorge of a channel is the contracted part of the channel as it exists inside the bar or mouth of the channel.

Q. Now taking the two channels as shown on Washington's Exhibit H, delineated in red lines, please indicate where the gorge or throat of each of those channels is.

A. Taking the north channel first, the gorge is between Cape Disappointment and Sulphur Spit.

Q. And Sulphur Spit is the nearest point south of Cape Disappointment on the sand, is it?

A. Yes sir; and it corresponds to the Republic Spit of the present day.

Q. Now give us the gorge or throat of the south channel.

A. The gorge or throat of the south channel is just south of Sand Island, as it appears on Washington's Exhibit H, where depths of 78 feet exist.

Q. I understood you to testify upon a former occasion, that you had charge of the construction of the jetty by the Government, from Fort Stevens.

A. Yes sir, since 1888.

Q. Since 1888 up until 1905?

A. Upon until 1905.

Q. I desire to inquire of you, in the light of your experience there

what, in your opinion, would be the effect of the construction of a jetty from Cape Disappointment seaward; I mean what effect would it have with reference to the permanence of the present bar channel, being the one delineated in black on Washington's Exhibit
330 H, and marked "1905 channel"?

A. It would create and maintain a deep channel between the jetties, seaward, and in a position practically the same as that shown by the 1905 channel line.

Q. Then, in your opinion, the 1905 channel line, if the jetty be constructed, would remain as the permanent channel of the river?

A. It would make it practically permanent in that position.

Q. Now going back to the north channel as shown upon Washington's Exhibit H by a red line, I will ask you to state what the records and charts and maps show with reference to that being or not being a permanent fixed channel.

A. The north channel has not been permanent in position or depth, as a rule, while the south channel has been the main channel used and the best for navigation.

Q. You may state what has been the history of that channel since 1859 with reference to deterioration.

A. The north channel?

Q. Yes sir.

A. The north channel has decreased in depth seaward as well as north of Sand Island.

Q. You have heard, I believe, the testimony of some of the captains and pilots wherein they stated that they preferred to use the north channel, which is marked upon Washington's Exhibit H in red ink. You may state, if you know, why the pilots preferred the north channel.

A. That was on account of their having a lookout on Cape Disappointment and also because the tugs could lie inside the point of Cape Disappointment in smooth water and always be prepared to go to sea; and, also, vessels going to sea could be brought down to anchorage in Baker's Bay, just inside of Cape Disappointment, and there await smooth bar.

Q. The anchorage at that time was available and good in
331 Baker's Bay, was it?

A. Yes sir.

Q. I wish you would describe generally the topography of Cape Disappointment.

A. Cape Disappointment is a rocky point that extends out or is located in the Pacific Ocean, and is the westerly extremity of the State of Washington, as shown on Washington's Exhibit H, and has an elevation varying from 150 to 300 feet.

Q. It rises very suddenly, does it not?

A. It is very abrupt, yes sir.

Q. To a distance of 150 feet and upwards?

A. Yes sir.

Q. Vessels or tugs lying in Baker's Bay and north of the southerly extremity of Cape Disappointment would then be effectually protected from the winds and storms?

A. From the westerly and southwest winds.

Q. If you know, I wish you would state the date of the last survey of Baker's Bay.

A. The last official survey of Baker's Bay was made in 1896.

Q. You may state, if you know, whether or not the channel north of Sand Island since that date (1896) has increased or decreased in depth.

A. It has decreased.

Q. I desire to inquire whether or not it is or was possible for vessels to pass in or out through a supposed bar channel on the line due west from the most southerly point of Cape Disappointment, as shown by the charts of 1854 and 1868.

A. There could be no channel on such line as you describe, as the soundings and hydrography of 1852, as shown on Washington's Exhibit H, are marked by breakers all around it, to keep
332 vessels out of that particular place. So that it would not be possible for a vessel to have come in that way in 1854.

Q. You are familiar with the preparation of these various charts and maps by the Government, are you, Mr. Hegardt?

A. Yes, sir.

Q. I wish you would tell us what the designation of the word "breakers" upon a map indicates, and what information it conveys to mariners, captains, and persons having business on the river.

A. It conveys the most positive information to mariners and captains to keep away from such places; and they are also generally marked by buoys in the channels.

Q. I wish you would give us the same information as to 1868.

A. On Oregon's Exhibit No. 9, which contains the hydrography of 1867 and 1868, just seaward and southwest of the southerly point of Cape Disappointment, appear the words "north breakers" and contours which indicate that the depth of water on the line described by counsel is from 12 feet to bare at low water, which would effectively prevent any vessel of any draft passing in the Columbia River on that particular line.

Q. Now I desire to refer to these channels east of Point Ellice and north of the south channel upon that part of the river, and ask you to state what has become of them and whether they are navigable and can be used as ship channels.

A. Those various channels regarding which you asked me die out or are lost in the sands above and are not considered as ship channels, nor can they be used as such for sea-going vessels of any considerable draught.

Q. I wish that you would take Washington's Exhibit I, and describe fully and in detail the channel lines marked thereon, and state fully upon what information and data they are based,
332 and whether they are correct and show the ship channels as of that date.

Mr. ALLEN: Wasn't that all gone over on direct examination?

Mr. MACDONALD: Yes, but I want the witness to testify in view of

the fact that Mr. Lewis has partially testified that the lines were not correct.

Mr. ALLEN: He said they were before, didn't he?

Mr. MACDONALD: I couldn't determine from his testimony whether he reached the conclusion they were correct or incorrect.

Mr. ALLEN: Mr. Hegardt testified they were correct on direct examination, did he not?

Mr. MACDONALD: Yes, but he didn't go into it very fully.

WITNESS: The red lines?

Mr. MACDONALD: Yes.

WITNESS: The channel line on Washington's Exhibit I, as indicated in red and marked "1859 channel line" and "1875 channel line," north of Snag Island, otherwise known as the Cordell Channel, was taken from a certified map from the Department in Washington, on which was shown the buoys and other aids to navigation, and were correctly transferred to this particular map marked Washington's Exhibit I. Having correctly transferred the buoys and other aids to navigation from that map which contained the hydrography of 1867 and 1868, the channel line as shown on Washington's Exhibit I was drawn between the buoys defining that channel. These buoys were marked on the certified copy of the chart which I refer to, by the authorities in Washington, where the map was printed; and this 1859 channel line and the 1875 line of the Cordell channel locates the channel as closely as it is possible to do so from the records furnished.

334 Q. Still referring to Washington's Exhibit I, I call your attention to a notation made on the bottom of it: "Resurveys (Main Channel to Buoy No. 14) by Lt. Comdr. A. S. Snow, U. S. N. and C. Rockwell, Assistants, in 1885 and 1889." Can you indicate upon that map where those resurveys are?

A. I think the resurvey referred to in those years was above Tongue Point and on the particular place known as the Hog's Back. I know personally that Captain Cleveland Rockwell made this survey in 1889, and the 1859 channel line passes through that portion which was resurveyed by Captain Rockwell as stated.

Q. Can you indicate upon this map what is known as the "Hog's Back?"

A. The Hog's Back is between the points or names "Channel" and "Line" of the 1859 channel line, as shown on the westerly end of this chart.

Q. Are you familiar with the dredging that has been done in the vicinity of Pillar Rock?

A. Yes, sir.

Q. I understand that that dredging was done between Pillar Rock and the Washington main-land.

A. Yes, sir.

Q. You may state what effect that has had upon the channel—whether it has had a tendency to change its course in the immediate vicinity or east of Pillar Rock.

A. The dredging done at Pillar Rock was done for the purpose of increasing the depth of water and increasing the volume of water

passing through it, with the view of creating a strong or scouring current, thereby receiving the aid of the natural forces in keeping this channel open.

335 Cross-examination.

By Mr. ALLEN:

Q. Mr. Hegardt, over what portion of the river had you jurisdiction in the construction of the jetty?
A. From Tansy Point to the sea.
Q. Did you ever have anything personally to do with the river east of Tansy Point?
A. Yes, sir; at times I was brought up there in the capacity of a consultant.
Q. Did you ever have anything to do with the actual surveys except in the capacity of a consultant?
A. The party that worked up there and made the last survey, in 1889, I think, was partially under my direction.
Q. But you were not the party in authority as far as concerned these surveys, or any of them?
A. I had about the same authority as I had on all the balance of the work.
Q. Did you have the same authority that you had over the jetty work?
A. Yes, sir.
Q. For how long a time?
A. Just on that particular survey.
Q. Did you actually do the work as indicated upon Washington's Exhibit I?
A. No, sir.
Q. Then you have no personal knowledge of it?
A. Yes, I was up there a number of times when dredging was being done.
Q. I am not referring to the dredging; I am referring to the marking and improvement of these channels, the surveying of the channels.
A. No, sir.
336 Q. The setting of the buoys, etc.?
A. No, sir. That does not belong to the engineering part of the work in any case.
Q. The dredging done at Pillar Rock was for the purpose of deepening what particular channel as delineated on Washington's Exhibit I?
A. The 1905 channel?
Q. What effect did that have upon what is designated in red as the 1859 channel?
A. It naturally diverted a considerable amount of water from that channel.
Q. Do you know whether as a matter of fact it did?
A. There is no doubt about it.
Q. Do you know that personally, of your own knowledge?

A. Well, I didn't make any measurements.
Q. Well, I say, do you know that to be true?
A. I know it as well as anybody can know it.
Q. Just as a scientific conclusion?
A. Yes, and from personal observation.
Q. Have you been through this 1859 channel lately?
A. No, sir, not since 1894, I think.
Q. Don't you know as a matter of fact that it is being used at present?
A. It is very likely used by some fishing boats and other craft.
Q. How deep are the average draught vessels using that channel at the present time?
A. I don't think any pass through it.
Q. Don't you know that river steamers from Portland travel it quite frequently?
A. No, sir, I don't know that.
337 Q. Don't you know that in the last five years this channel, on account of the shoal water, was used considerably more than the other channel was used?
A. What channel?
Q. The 1905 channel, where it crosses the river; and therefore the 1859 channel was used?
A. No, sir; I don't know it.
Q. You don't dispute it?
A. No, sir. I am perfectly willing to admit I don't know a thing whent I don't know it. I doubt, however, whether any sea-going vessels pass through there.
Q. Do you know that ocean-going vessels have not used what is delineated upon Washington's Exhibit H as that portion of the channel between Point Ellice and Knappton?
A. Yes, they frequently go up as far as Knappton; that is as far as they go.
Q. Do you not know that it is a general custom of lumber-carrying, ocean-going schooners to return from Portland by way of Knappton and Point Ellice?
A. No, I didn't know that.
Q. You don't say they could not?
A. Well, I think it would be very improbable, for this reason——
Q. Why so? How much tide is there there?
A. I have had surveys made through here every year, and the captain of a steamer engaged all through this territory here, from year to year, would not know where to go. It would change maybe in two or three months. He would not be able to take a steamer drawing seven feet of water through it.
Q. Well, that is not an answer to the question. I want to know what would prevent a man who knew the channel from going through there.
338 A. I tried to say that a man who was actually engaged in these waters all the way down here, even in a difference of time of three months, would not know where he was going.
Q. That is the same way with the bar, is it not?

A. No, sir; the bar is marked by buoys.

Q. Do you know that there is no buoy in the north channel from Point Ellice to Knappton?

A. There are buoys there.

Q. Are there buoys from Knappton to the quarantine station?

A. Yes.

Q. Are there any buoys above the quarantine station?

A. I think there are not.

Q. Will you swear that there are not?

A. I have not seen any, and I have been through there a number of times. I would be very glad if they would put some around there; it might aid some of the smaller craft.

Q. The commencement of the construction of the jetty was in 1885, was it not?

A. Yes, sir.

Q. How much of it was constructed in 1885, if you remember?

A. A very small portion.

Q. During what years was the greatest amount of the jetty constructed?

A. After 1889 the principal work was done.

Q. That jetty is tied on its eastern extremity to Point Adams, is it not?

A. Yes, Point Adams.

Q. And extends seaward perhaps four miles and a fraction?

A. No, it is nearly six miles.

Q. Nearly six miles?

A. Yes.

Q. At present?

A. At present.

Q. And you say the south channel has always been the
339 safer channel?

A. Always so considered by the parties.

Q. So considered for how long a period?

A. Since I first went there; that was in 1888. In conversation with the principal and best pilots they have always told me the south channel was the safest channel.

Q. You say that the north channel has been continually changing?

A. It is continually changing, yes, sir.

Q. What is the character of that portion of Washington's Exhibit H delineated in yellow, outside of the headland of Cape Disappointment?

A. Inside of those particular lines the depth of water is less than 18 feet.

Q. That, then, I suppose, is sand bars covered by water?

A. Covered by water.

Q. To a depth of 18 feet?

A. To a depth of 18 feet or less.

Q. Do you know whether or not they are entirely surrounded by breakers?

A. This map would indicate that they are. There are breakers all around them.

Q. The same as that immediately west of Cape Disappointment?

A. Yes, sir.

Q. Now, isn't it a matter of fact, Mr. Hegardt, that when you went on to the river to act as superintendent of the jetty construction, that the breakers washed over Sand Island every day, or over the greater portion of it?

A. No, sir.

Q. Up to high water mark?

A. Oh, up to high water mark?

Q. Yes, sir.

340 A. Oh yes, there are breakers there.

Q. And the whole bar is a mass of breakers, isn't it?

A. Not always, no sir.

Q. Well, isn't that the general characteristic of the Columbia river bar?

A. No sir.

Q. Do you mean to say that the north channel and the south channel are never covered with breakers?

A. No, I never said that. You said they always were, and I said not always.

Q. Explain what you mean by breakers on the bar.

A. There are breakers on the bar after storms when the velocity of the wind has been very high; waves naturally break under those conditions in that depth of water. For months there may be no breakers on the bar, and again they may be there every day if the storms continue.

Q. I call your attention to that portion of Washington's Exhibit H in which the following language is used: "No vessel should attempt to go out over the bar when there are more than three lines of breakers upon it." Isn't it a matter of fact that there are generally at certain seasons of the year three lines of breakers on that bar clear across from Cape Disappointment to the jetty?

A. Yes, there are times when there would be more than three breakers on the bar.

Q. Then, the fact that there are breakers on one portion of this map or another does not also indicate that there are not channels?

A. Yes sir, it certainly indicates that.

Q. Did you hear the testimony of the pilot who said that the north channel was a double channel and that it was possible in 1860 to come in from the northwest of Cape Disappointment to what is designated as Peacock Spit, to the southwest, and go into the

341 ocean?

A. I heard him testify.

Q. Without entering the river?

A. I heard him testify to that effect.

Q. You would not dispute that?

A. I would say that that was a very unusual occurrence.

Q. Well, you would not dispute it?

A. I don't dispute it, no sir; I don't dispute anything that a pilot says, as a rule.

Q. Now, is it not a fact that the United States Army Engineers have made a recent survey of the channel to the north of Sand Island and at present maintain a system of signals marking this channel, beyond the line of which no fishing traps are permitted to encroach toward Sand Island?

A. I know of no recent survey except that I made a preliminary examination of it about a year and a half ago, which showed decided shoaling from previous surveys.

Q. Yes, but those signals still remain, do they not?

A. They were not signals.

Q. What were they?

A. They were simply beacons to define the line beyond which fish traps could not be extended into the channel.

Q. Now, what vessels at the present time are in the habit of travelling the channel north of Sand Island, going to Ilwaco and Portland?

A. I think the steamer T. J. Potter.

Q. The steamer T. J. Potter is a boat drawing how much water?

A. I should not think she draws over 7 or 8 feet.

Q. She draws about 8 feet?

342 A. Yes.

Q. How much of a rise and fall is there to the tide?

A. 7½ feet.

Q. So at high water what would be the mean average depth of the north channel, north of Sand Island?

A. You mean at the upper end of Sand Island, or the lower end?

Q. The upper end.

A. There would be three feet at low water, and about ten feet at high water.

Q. Where did you say that this composite map was constructed, and by whom,—the map designated as Washington's Exhibit H?

A. It was constructed in Portland under my direction.

Q. From what was it taken?

A. From official records.

Q. Where are those records?

A. They are certified copies.

Q. Have they been introduced in evidence?

A. The State of Oregon has introduced them in evidence.

Q. Will you kindly designate what of Oregon's Exhibits introduced in evidence were the foundation for the composite map designated as Washington's Exhibit H?

A. Oregon's Exhibit No. 5 contains the hydrography of 1852.

Q. You need not go into details; just give the number of the exhibits.

A. That is the hydrography shown on Washington's Exhibit H in orange color and red lines.

Q. Now, take up the other, please.

A. And the hydrography on Washington's Exhibit H, on a line

west of Point Adams and Chinook Point, was taken from the
343 hydrography of 1851, as shown on Oregon's Exhibit No. 4

Q. Did you have any other maps or have access to any other maps in making this composite map which you used?

A. We had Washington's Exhibit H showing the latest survey of the mouth of the Columbia River—a certified copy furnished by the Department.

Q. And whence was it secured?

A. From the City of Washington, under the seal and certificate of the Department of Commerce and Labor.

Q. The Hog's Back that you mention is a sand, isn't it?

A. That is a sand, yes sir.

Q. Where did you get the material for the delineation of the line designated on Washington's Exhibit I, that is the 1859 channel, marked in red?

A. I testified that I got the location of the buoys and aids to navigation from the certified map before referred to.

Q. How?

A. By transferring it from a certified copy.

Q. What certified copy?

A. A certified copy which is now in the possession of the State of Washington.

Q. Has it been introduced in evidence?

A. No sir. I testified that the aids to navigation were correctly transferred.

Mr. MACDONALD: Do you question the accuracy of the reproduction of this map which is referred to by Mr. Hegardt?

Mr. ALLEN: There seems to be some discrepancy between the two engineers. If there is, I desire to introduce that map.

WITNESS: We can get a copy of it.

344 Re-direct examination.

By Mr. MACDONALD:

Q. Now, Mr. Hegardt, with reference to the transferring of these beacons, buoys and aids to navigation to Washington's Exhibit I, please state again from what source you obtained the information.

A. From a certified copy of the hydrography of 1867 and 1868, published in 1870.

Q. Was that a map or chart certified to by the Department of Commerce and Labor?

A. Yes sir; and it was a companion map to Oregon's Exhibit No. 9.

Q. Showing the Columbia River easterly of that portion shown on Oregon's Exhibit No. 9?

A. Yes sir.

Q. Did you in person make the transposition of aids to navigation from the chart you have referred to, to Washington's Exhibit I?

A. I did.

Q. Do you know of your own knowledge whether the transposition is correct?

A. It is correct, and was accurately made.

Q. Is it not a fact that previous to the dredging at Pillar Rock that ocean-going steamers passed south of the Rock?

A. Yes sir.

Q. And since the dredging they pass north of it?

A. North of it.

Q. Between it and the main land?

A. Yes sir.

Q. What is the fact with reference to breakers occurring more frequently and of larger size on shoals than in channels?

A. The reason for that is that the depth of water as it de-
345 creases shortens the waves and increases them in height.

Q. So that the shoaler the ground, the greater are the breakers in height?

A. The more readily the water breaks, and the greater the force.

E. C. MACDONALD being duly sworn as a witness on behalf of the State of Washington, testified as follows:

My name is E. C. Macdonald; I reside in the City of Spokane, State of Washington. Since the middle of January, 1905, I have been one of the Assistant Attorneys General of the State of Washington. The suit in which this testimony is being taken was instituted in the Supreme Court of the United States by direction of the Governor of the State of Washington, and in pursuance of a legislative enactment of the Legislature of the State of Washington authorizing the commencement of the suit, and appropriationg money to pay the expenses thereof. The suit is likewise brought at the instance of the Attorney General of the State of Washington, who, by the laws of the State of Washington, is authorized to rep-
346 resent the State in all suits pending in all courts or in any matters wherein the State of Washington has or claims to have any beneficial interest or otherwise.

No cross examination.

Stipulation.

It is hereby stipulated and agreed by and between the parties hereto that this suit was instituted under the direction of the Governor of the State of Washington in pursuance of legislative enactment by the Legislature of the State of Washington during its session of 1905; and it is further stipulated that in the event that the Supreme Court of the United States shall not approve of this stipulation and shall hold that proof is insufficient to show that this suit was instituted by the proper authority of the State of Washington, a continuance may be had to obtain further testimony on that point.

It is also further stipulated that this suit is defended by the Attorney General of the State of Oregon, and that he is authorized by the laws of said State, and it is made his duty, to appear and defend all suits in which the State of Oregon is a party or is interested, and

to set up and maintain all defenses and rights which said State may have therein.

Mr. MACDONALD: I think the State of Washington will have no further oral testimony. It is quite probable, however, that I may desire to file some certified copies of records showing the taxation by the State of Washington of certain of these islands in dispute, and I will ask leave of counsel on the other side to file such
347 certified copies direct with the Clerk of the United States Supreme Court, first furnishing counsel for the State of Oregon with a copy thereof.

Mr. CRAWFORD: Will you enter that as a stipulation to apply to both parties?

Mr. MACDONALD: Certainly.

Mr. ALLEN: We want to do the same thing.

Mr. CRAWFORD: That is, that each party may furnish certified copies of such records as it may hereafter deem pertinent.

Mr. MACDONALD: You need not give me a certified copy; just give me an ordinary copy.

Stipulation.

The State of Washington having offered in evidence certain portions of official reports, which reports were marked respectively Washington's Exhibit B, Washington's Exhibit C, Washington's Exhibit D, Washington's Exhibit E, Washington's Exhibit F and Washington's Exhibit G, it is hereby stipulated and agreed by the parties that the portions of said reports so offered may be transcribed into and made a part of the record herein, and the said parties do hereby waive the filing of the original exhibits so offered, and the portions so introduced in evidence and copied as a part of the record herein may be considered for all intents and purposes as part of the evidence as though the originals were actually filed with the Clerk of the Supreme Court.

348 Complainant offered in evidence map entitled "U. S. Coast Survey, Benjamin Pierce, Supt., Columbia River, Sheet No. 2, Edition of 1875, C. Patterson, Superintendent."

The same was marked Washington's Exhibit L and signed by the Commissioners.

349 Superior Court of the United States.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Certificate of Shorthand Reporter.

UNITED STATES OF AMERICA,
State of Oregon, County of Multnomah, ss:

I, the undersigned, do hereby certify that I was appointed by the respective parties to the above-entitled cause to report the testi-

mony and proceedings therein; that I was present at the examination of all of the witnesses on behalf of the complainant, as herein set forth; that I made in shorthand writing a complete and accurate report of the proceedings and of the testimony of all of such witnesses, and that the foregoing pages are a complete and accurate transcript of my shorthand notes therein.

ROBT. S. TAYLOR.

Dated at Portland, Oregon, August 1, 1906.

350 Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Commissioners' Certificate.

UNITED STATES OF AMERICA,
State of Oregon, County of Multnomah, ss:

I, C. C. Dalton, and I, John W. Reynolds, do each hereby certify that said C. C. Dalton is a Notary Public duly commissioned by and for the State of Washington, and said John W. Reynolds is a Notary Public duly commissioned by and for the State of Oregon.

That both of us, the said C. C. Dalton and John W. Reynolds, have been, in pursuance of stipulation herein duly agreed upon and appointed by said States of Washington and Oregon, respectively, by their respective attorneys, as Commissioners jointly to take the testimony of the witnesses in the above entitled cause and to certify the same jointly to this Honorable Court.

That each of us before proceeding to take the testimony herein, duly took and subscribed an oath to support the Constitution of the United States and faithfully and impartially to discharge our duties as such Commissioners, which oaths are herewith filed.

That the foregoing depositions of witnesses on behalf of the complainant were taken before us jointly as such Commissioners on oral interrogatories, between the hours of ten o'clock in the forenoon and four o'clock in the afternoon, on the dates and at the places following, respectively:

Deposition of G. B. Hegardt, on July 16, 1906, July 17, 1906, and July 13, 1906, at The Breakers, Pacific County, State of Washington, and on July 26, 1906, at Hotel Portland, City of Portland, Multnomah County, State of Oregon;

351 Deposition of F. A. Boutelle, on July 17, 1906, at The Breakers, Pacific County, State of Washington;

Deposition of E. W. Ross, on July 17, 1906, at The Breakers, Pacific County, State of Washington, and on July 24, 1906, at Hotel Portland, City of Portland, Multnomah County, State of Oregon;

Deposition of Daniel Markham, on July 17, 1906, at The Breakers, Pacific County, State of Washington;

Deposition of L. D. Williams, on July 17, 1906, at The Breakers, Pacific County, State of Washington;

Deposition of W. D. Whealdon, July 17, 1906, at The Breakers, Pacific County, State of Washington;

Deposition of T. R. Kershaw, on July 17, 1906, at The Breakers, Pacific County, State of Washington;

Deposition of Edmund Jussen, on July 18, 1906, at The Breakers, Pacific County, State of Washington;

Deposition of E. C. Macdonald, on July 26, 1906, at Hotel Portland, City of Portland, Multnomah County, State of Oregon.

That said depositions and testimony so taken were reported in shorthand writing by Robert S. Taylor, the shorthand reporter duly agreed upon and appointed by the respective parties to said cause to report said testimony, and were by said Robert S. Taylor, under our direction, reduced to typewriting, and the certificate of said Robert S. Taylor as to the correctness thereof is hereunto appended.

That before proceeding to report said testimony, said Robert S. Taylor was by us duly sworn to report and transcribe the same truly, faithfully and correctly.

That before said testimony was taken, each of said witnesses was by us duly sworn to tell the truth, the whole truth and nothing but the truth.

That the reading and signing of said depositions by the
352 respective witnesses was duly waived by stipulation of the parties hereunto by their respective attorneys, which said stipulation is set forth in the record of said depositions.

That exhibits were introduced in evidence on the part of said complainant and marked as follows, said marks being authenticated by our signatures as Commissioners, to-wit:

Washington's Exhibit B.
Washington's Exhibit C.
Washington's Exhibit D.
Washington's Exhibit E.
Washington's Exhibit F.
Washington's Exhibit G.
Washington's Exhibit H.
Washington's Exhibit I.
Washington's Exhibit J.
Washington's Exhibit K.
Washington's Exhibit L.

That exhibits marked Washington's Exhibit B, Washington's Exhibit C (except maps 2 and 3 of same), Washington's Exhibit D, Washington's Exhibit E, Washington's Exhibit F, Washington's Exhibit G and Washington's Exhibit J, have been copied and set forth in the record of testimony, and it was duly agreed and stipulated by the parties hereto, by their respective attorneys, that said copies of said exhibits may stand for and in place of the original exhibits so marked.

That the foregoing are all of the exhibits offered or introduced

before us on the part of said complainant, and said exhibits marked Washington's Exhibit H, Washington's Exhibit I, Washington's Exhibit K, Washington's Exhibit L, and maps 2 and 3 of Washington's Exhibit C are hereto attached and made a part hereof.

That the foregoing is a true and complete transcript of the depositions and evidence taken before us on behalf of the defendant in the above entitled cause and of the whole thereof and of all objections made thereto, and of the stipulations entered into between the parties during the progress of the taking of the testimony on behalf of the complainant, and consists of pages numbered 1 to 314
353 of the record of testimony taken before us in said case.

In witness whereof, we have hereunto subscribed our names and affixed our notarial seals this 4th day of August, 1906, at The City of Portland, Multnomah County, in the State of Oregon.

[Seal C. C. Dalton, Notary Public, State of Washington.]

C. C. DALTON,
Commissioner and Notary Public for the State of Washington.

Commission expires July 9, 1910.

[Seal John W. Reynolds, Notary Public, State of Washington.]

JOHN W. REYNOLDS,
Commissioner and Notary Public for the State of Oregon.

354 In the Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
vs.
STATE OF OREGON, Defendant.

Record of Testimony on Behalf of State of Washington.

By mutual agreement and consent of the parties, the taking of testimony in the above entitled case was resumed this 13th day of September, 1906, at the Portland Hotel, Portland, Oregon, the State of Wahsington appearing by E. C. Macdonald, Assistant Attorney General of the State of Washington, and George W. Allen, Esq.; and the State of Oregon appearing by A. M. Crawford, Attorney General of the State of Oregon, Honorable Harrison Allen, District Attorney, and A. M. Smith, Esq., of counsel.

It is mutually stipulated that the taking of testimony be and the same is hereby opened for the purpose of taking additional testimony on behalf of both parties.

It is further mutually stipulated and agreed that John H. Pelletier shall act as reporter to take the testimony in shorthand and reduce the testimony of each witness to writing; and that the actual signing of the testimony by each witness is hereby expressly waived.

It is further stipulated and agreed that the said John H. Pelletier

shall take and subscribe the usual oath before proceeding to take the testimony, and that said oath be attached to the testimony as extended.

The respective parties hereto hereby pray that the Supreme Court approve this stipulation.

355 Captain CLEVELAND ROCKWELL called as a witness on behalf of the plaintiff, after being first duly sworn, testified as follows:

Direct examination.

By Mr. MACDONALD:

Q. Captain Rockwell, will you be good enough to state your name and residence?

A. My name is Cleveland Rockwell, residence 1100 Vaughn street, Portland.

Q. How long have you resided in the City of Portland, Captain?

A. Oh, I have resided here 15 years.

Q. And how long have you resided in the State of Oregon?

A. Well, you might say it was 25 years, I guess.

Q. Twenty five years?

A. Yes.

Q. I will ask you to state what official position, if any, you have had with the United States government.

A. What was the question?

Q. I will ask you to state what, if any, official positions you have had with the United States government.

A. Up to 1892, when I resigned, I was an officer of the United States Coast & Geodetic Survey, that is, what is called an assistant.

Q. I will ask you to state when you first became connected with the government in an official capacity.

A. I was first connected with the Coast & Geodetic Survey in 1856.

Q. And as I understand it, you were continuously in that service, until you resigned in 1892?

356 A. Yes, I was continuously in that service with the exception of four years in the War of the Rebellion. Four years in the army. I was still paid by the service, but I was under orders of the army officers.

Q. I will ask you whether or not, in connection with your official position, you performed any work upon the Columbia river with reference to the hydrography and topography.

A. Yes sir, I was in charge of the party engaged in that work for a good many years. I first commenced that work in 1868, at the mouth of the Columbia. I worked, I think, four or five years continuously. I can't recall the dates, but the records of the Coast Survey office will show that and my reports. Afterwards, I was for many years again on the Columbia river.

Q. I wish you would state in detail, Captain Rockwell, the character of work you did upon the Columbia river.

A. On the lower part of the river, from Three Tree Point, or Brookfield, about down to the mouth I was engaged wholly upon the topographical work, which is the delineation of the shores and the land. Above that point, my work on the river embraced the triangulation, which is the base of all the other work. The topography and the hydrography in different places, the practical work which goes to make up a chart of the river.

Q. I will ask you to state whether your work necessitated your being on the river a great deal during all those years?

A. Yes sir, in my work, I might say I lived on the river, either on a house boat or a schooner or a camp on the shore, and
357 as usual, with Coast Survey parties, the officer in charge does all the work himself, personally.

Q. I will ask you to state, Captain Rockwell, whether you are the same person whose name appears on these government maps as, "C. Rockwell"?

A. Yes sir, that is an abbreviation of my name.

Q. You may state what experience you have had in surveying or hydrography in other waters than the Columbia river.

A. Well, that would make a pretty long session. I was 36 years in the service, engaged somewhere on the Atlantic Coast and this coast.

Q. I would like to direct your particular attention to the work which I understand you did in the New York Harbor and the Boston Harbor.

A. Well, in respect to that, in 1856, the State of New York appointed a commission to control the Harbor of New York, and not being able to make the exact surveys necessary to fix the question of the preservation of that harbor, the State called upon the Government and the Government appointed the Coast Survey to do the work. I was on that. That was one of my first works. I was engaged in that work. The State paid all the expenses of the party, and the officers were paid by the Government. I was several years on that work.

Q. You may state in a general way, Captain, what the character of that work was, as performed by you.

A. The character of that work was to define the limited or the harbor lines as they call them here, beyond which no construction, either open or solid, could be extended. That work required a very critical survey, in order to determine them. The same class of work was done by the Coast Survey in Boston Harbor, in
358 which I took part. In the years '63 and '4, I was acquainted with the work in both those harbors, the class of work that is necessary to do.

Q. I desire, Captain Rockwell, to call your attention to Washington's Exhibit H, which is a map of the entrance to the Columbia river. I call your attention particularly to a black line, which is marked: "1905 channel line," and ask you to state, if you know, where the commercial or main ship channel of the Columbia river was when you first came to the river, which I understand was in 1868.

A. The commercial channel of the bar, or inside of the head?

Q. From the ocean in as far as Astoria.

A. What was known as the south channel was then the principal channel that was used.

Q. Is that the channel which is approximately designated by the red line marked "South channel line 1854?"

A. This line would be approximately that channel, but I cannot say whether it was exactly. At that time this spit did not come across like that, (indicating on map).

Q. I will ask you to state, if you know, which channel was the one generally used by the ocean going steamers in coming from the ocean up to Astoria, and also further up the river.

A. It was the south channel.

Q. It was the south channel?

A. It was the south channel.

Q. I desire to call your attention Captain Rockwell, to the 1854 hydrography which is platted upon this map within the red colors.

359 A. This yellow surface, (indicating).

Q. Yes sir, and I will ask you to state where the mouth of the ship channel is as shown on that map, assuming that the hydrography is correct.

A. The mouth of the channel?

Q. Yes sir.

A. Well, I should call the mouth of the channel where it enters from the ocean.

Q. Would you be good enough to designate that point upon the map, Captain Rockwell?

A. This is evidently the bar. Here is the entrance to the channel. I should call that the mouth of the channel (indicating on map). It is where you enter the channel from the ocean. That is the mouth of the channel.

Q. That would be approximately at the intersection of this red dotted line marked "1 marine league due west" with a red line above, on which the words "north channel line" appear?

A. Yes, it would be quite that. There is a buoy marked there, to guard that spit.

Q. I will ask you whether or not you would consider the mouth of the north ship channel at the end of this blue line where it joins a curved blue line just south of Cape Disappointment?

A. Whether I would consider that the mouth?

Q. Yes sir, of that channel.

A. No, I would consider this the mouth of the channel, (indicating) the entrance into the Columbia from the ocean.

Q. At the intersection of these two red lines?

A. Yes sir, I would consider that the mouth.

Q. I desire to direct your attention to this blue line upon

360 Washington's Exhibit H, which is the boundary line as claimed by the State of Oregon, and will inquire of you, from your personal knowledge of the river, and its channels, and your study of the maps and government publications, whether, within

your knowledge a channel which would be shown by that blue line has ever been used as a commercial channel or a channel for deep sea going vessels coming from the ocean and passing up the river, or coming back.

A. I can't recognize on this map where the old north channel was. It never took that course.

Q. That is, it never took the course which leads it above Sand Island, as shown on the map here, Washington's Exhibit H?

A. Not in that Sand Island, that is, the Sand Island I was familiar with.

Q. The Sand Island you speak of now, is the one shown on the red?

A. Yes sir.

Q. And further above than the present location?

A. Yes sir. I know I used to go with my schooner to the head of that, and go right around through there (indicating on map).

Q. That would be over a course which now would carry it over the southern part of the present Sand Island?

A. Yes sir, it would go right over Sand Island. I anchored there, (indicating).

Q. I will ask you then, Captain, whether you have ever known of vessels pursuing a course which carried them as far north as is shown by this blue line.

A. I never heard of vessels going that far.

361 Q. You are familiar with the location of Desdemona Sands, are you, Captain?

A. Yes sir.

Q. I will ask you whether or not, to your knowledge, Captain, and from your personal experience upon the river, and from your study of the maps and surveys you have ever known of a channel used by the ocean-going steamers as the main ship or commercial channel which passed north of Desdemona sands.

A. No, I never knew of any ships or vessels taking that channel except to go to Knappton.

Q. I will then ask you to state what course the ocean-going vessels used in passing to Astoria and Portland, with reference to being north or south of Desdemona Sands? I mean by that the main ship or commercial channel.

A. It was always on the south side of Desdemona sands; the commercial channel; always. If they ever passed on the other side, it was before my day.

Q. You are familiar with this north channel as it existed at the time you first came on the river, in '68?

A. I was tolerably familiar with it.

Q. You may state which was the better channel at that time, the north channel or the south channel.

A. The south channel was the main channel in use at that time. It was several years, I think, before the north channel developed sufficiently to be a channel for commerce. That south channel was afterwards abandoned.

Q. I desire to now invite your attention to Washington's Exhibit

I, which is a certified copy of the Coast and Geodetic Chart, 6141. I will first inquire of you, Captain Rockwell, if you have ever
362 known of a ship channel or commercial channel existing where this blue line, marked "boundary line as claimed by Oregon", up to the point of its junction with the black line.

A. No, I never knew of any such channel being used.

Q. Have you ever known of vessels, deep sea vessels, passing over such a course?

A. I never have, never heard of such a course as that. That is Gray's Point. No, I never heard of vessels using that course.

Q. When you first came upon the river, in 1868, I will ask you to show upon this map the commercial or ship channel then in use for vessels coming from Portland to the sea, or from the sea to Portland.

A. The channel in use at that time was this one, the Astoria channel, right there by Tongue Point. They took this channel, the Woody Island channel, when I first came here.

Q. Is that the channel which is approximately the channel shown by the red lines marked "1859 channel line" passing to the south of Snag Island and through Woody Island channel?

A. Yes, that is about the line, although here it was different, it swung down through here somewheres at that time, (indicating on map), but that is the channel in use in '68.

Q. Through Woody Island channel?

A. Yes, the Woody Island channel?

Q. Can you state when that Woody Island channel ceased to be used as the commercial or main ship channel?

A. Well, it ceased to be used after the survey by Cordell
363 in 1867. The survey by Cordell developed this channel, which is put down here as the Cordell channel. It was afterwards reported and examined by the pilots and they buoyed it and abandoned the Woody Island channel, I think, in '68 or '69. I am not so certain which year they buoyed it, but they abandoned this channel and buoyed this one, (indicating).

Q. You may state, Captain, how long the Cordell channel was used as the commercial or main ship channel.

A. I don't think I could state that. I don't remember the time when they shifted into this channel.

Q. Could you approximate the time?

A. I don't think I could.

Q. It was for some years, at least?

A. Oh yes, it was a number of years they used this channel.

Q. You are familiar with the direction of the current of the river where it strikes the Washington shore in the vicinity of Three Tree Point, are you, Captain, the direction of the current?

A. Three Tree Point, yes sir.

Q. I will ask you to state what the natural direction the flow of the current would be from that point, if there were no artificial aids, dredging, dikes, and so forth, put in the river.

A. Well, that is a hard question to answer, scientifically, Mr. Macdonald, what is the natural channel of a river. The natural

channel of a river is the channel it occupies when you see it running.

364 Q. Let me ask you this question, then. What is the natural flow of the river from Jim Crow Point, what direction would it naturally take?

A. I think it would naturally take, if sheered off by both these points, Jim Crow particularly, it would take this direction, (indicating).

Q. That is, down this red line towards Snag Island?

A. Yes sir, down the Woody Island channel. This was called Woody Island channel here up to here, then, and the Cordell channel running over there into the Woody Island channel. That was called the Woody Island channel, where it joined the river.

Q. I will ask you to state whether or not you are familiar with the dike built from Snag Island in a northeasterly direction.

A. No, I am not familiar with it. I see it drawn here on this chart, but I am not familiar with it.

Q. Assuming that a dike has been built across from Snag Island, across Cordell channel, which goes clear across the channel, I will ask you to state, what, in your opinion, would be the effect upon this channel going close to the Washington shore.

A. The effect of this dike?

Q. Yes, as to the flow of water along the Washington shore. Would it increase it or decrease it?

A. I don't know what is the character of that dike, whether it is a solid dike, like a dam, or whether it was open, but whatever character it is, it is an obstruction to the flow of the water, and according to its character, it would have a tendency to back the water up.

Q. To increase the flow of the channel along this black line close to the Washington shore?

365 A. Yes, if it dammed that water up, it would proportionately increase the flow upon that shore.

Q. Are you familiar with the dredging which has been done in the vicinity of Pillar Rock?

A. No, I am not.

Q. Assuming that some dredging has been done between Pillar Rock and the main land by the government, you may state what the tendency of that would be with reference to increasing or decreasing the flow of the water down the river close to the Washington shore at that place?

A. Oh, it would facilitate the flow of the water as a matter of course. Any dredging there would facilitate the flow of the water in that channel.

Cross-examination.

By Mr. CRAWFORD:

Q. About how far is it from the end, from the eastern end of the jetty to which you have just referred, to the Washington shore?

A. That is the eastern end, (indicating). I could only answer that question by reference to the scale of the map. (Witness scales distance). It would be a mile and a quarter.

Q. A mile and a quarter?

A. Yes sir.

Q. That jetty runs nearly up and down the stream, doesn't it?

A. It seems to lie there diagonally across the stream from shore to shore, diagonally across the stream from shore to shore.

Q. You mean diagonally across this channel?

366 A. Across the Cordell channel, yes.

Q. But the eastern end of it does not lie across a channel, does it?

A. The eastern end is built out on to the mud flats, apparently.

Q. And between what is represented on the map as Woody Island channel and the 1905 channel, isn't it?

A. What?

Q. Between what is represented on the map as the Woody Island channel and the north channel.

A. Yes sir, it is between those two channels.

Q. And it runs apparently parallel with the channels, or nearly so?

A. Well, no, it does not.

Q. To those two, doesn't it, on the map?

A. No, it doesn't lie parallel with the Woody Island channel; it crosses the Woody Island channel on an angle of about 70 degrees.

Q. Does it cross the Woody Island channel?

A. The Cordell channel, I should have said.

Q. I am speaking of the Woody Island channel.

A. It doesn't touch the Woody Island channel.

Q. Isn't it pretty near parallel with the Woody Island channel?

A. Yes, it is pretty nearly parallel.

Q. And it is nearer parallel with the north channel than it is across it?

A. You might say it is nearer parallel than it is across it?

Q. And it is a mile and a quarter, you say, from the north shore?

A. Yes.

367 Q. And at least a mile, or three quarters of a mile, from the north channel.

A. This is the north channel designated (indicating)?

Q. Isn't it in the neighborhood of that?

A. From that channel, from the north side of Pillar Rock, it would be about a mile.

Q. Now, about what is the usual size that these jetties are built?

A. The usual size?

Q. Yes, not in length, but the size of them.

A. Oh, well, I suppose they are eight or ten feet in width, ten or twelve.

Q. Then the main surface that would be presented to the current there as far as it relates to the Woody Island channel, and the north channel, would be the end of the jetty, wouldn't it?

A. How is that question? I beg pardon.

Q. I say, the main surface that would be presented to the current as related to the Woody Island channel, opposite the east end of the

ditch, and the current in the north channel, would be the end of the jetty, wouldn't it?

A. That is rather a complicated question, I don't exactly understand you. Can you put that question in any other way?

Q. I can. If a jetty is built substantially parallel with the current, the main surface that butts the current then, is the end of the jetty, isn't it?

A. Well, I suppose you might say if the end stuck out into the current, it would be the opposing end of the jetty.

Q. Captain Rockwell, I wish to ask you if Captain Welch
368 and several other captains have universally testified *Welch and several other captains have universally testified* that they never took big vessels south of Snag Island, you would believe them, would you not?

A. South of Snag Island?

Q. Yes sir.

A. Well, it depends on what you call big ships.

Q. Well, sea going vessels.

A. I know all the ships that come up to 1868 had to go south of Snag Island.

Q. They have testified that prior to 1868 they came into what is called the Woody Island channel, up to about Snag Island, and came in close to it, and north of Snag Island. You would say, then, they never could do that, would you?

A. Came into Woody Island channel, and go north of Snag Island. I should say that they were mistaken or had forgotten, or something.

Q. Now, then, you never heard of a channel across from Tongue Point to Harrington Point, prior to the time that it was buoyed out by the government, did you?

A. From Tongue Point to Harrington Point?

Q. Yes.

A. I have heard Captain Flavel say he used to run into the Tongue Point channel right over towards Yellow Bluffs.

Q. Long prior to that, in the early days?

A. Yes, but they didn't do it in '68, at that time.

Q. I am asking you if you heard that.

Q. Yes, I heard Captain Flavel say that. I think that is the only one of the pilots I heard say that.

369 Q. Didn't you ever hear Captain John Welch say that?

A. Captain John Welch, is he a pilot?

Q. Yes.

A. No.

Q. Did you ever hear Captain Phil Johnson say so?

A. No, I don't think I ever heard him say so. He never had occasion to say so to me. Flavel and I were chummy, and he used to tell me all sorts of things about running up there.

Q. When you first came to the river, about what was the size of vessels that were running on the river, that is, about what draught vessels?

A. Well, I suppose they was not over from sixteen to seventeen feet.

Q. And now they take vessels as high as twenty-six?

A. I believe so, twenty-two, anyway.

Q. One man said they had taken some twenty six. Your acquaintance with the river, I believe you stated, has been since '68 only?

A. Yes, I never was here before '68.

Q. Now, in 1868, or about that time, when you came here, there was a north channel by which you could come into the river north of Sand Island, was there not?

A. There was one there '68 or '69. I don't remember now.

Q. That was what was known as the north channel at the mouth, was it not?

A. That was known as the north channel.

370 Q. Coming down north of Sand Island.

A. Yes.

Q. Of course, Sand Island, I understand, has shifted its position a great deal since then.

A. Well, the north channel, they never went much around the north side of Sand Island. The north channel used to debouch up that way, (indicating). They never went up to the north of Sand Island.

Q. There is just one more question I want to ask you. I will ask you if you have any knowledge as to whether the object of putting in this jetty to which you have referred in your testimony, was not to throw the waters, which naturally would flow through what is marked on the plat as Cordell channel, down through what is marked Woody Island channel, south of Sand Island?

A. That was undoubtedly the object of it, or should have been.

Q. Now, you examine here, what is called Oregon's Exhibit No. 2, and state whether the north channel, as known to the government, United States Exploration Expedition, Commodore Wilkes, and the Coast Survey Department, did not then run north of what is called Sand Island?

A. This is the Wilkes Expedition Map, Coast Survey. It is not ours at all. You want me to state whether the north channel——

Q. The north channel.

A. —Runs——

Q. North of Sand Island?

371 A. Yes.

Q. That was then called Middle Sand Bank?

A. It undoubtedly does run north of Sand Island there.

Q. That was in 1841?

A. That is the date of it?

Q. Yes.

A. Yes sir.

Q. The two channels came together just as they went into the ocean, did they not?

A. Yes sir, they came together in one channel at the ocean, at the bar.

Q. The north and south channels. Now, Captain, examine the map called Oregon's Exhibit No. 4, and tell me whether there was a north channel existing at the date of that map, and whether it did not run north of what is called Middle Sands to Sand Island?

A. That is the Coast Survey map? The north channel at that time, as surveyed or published, ran north of Sand Island.

Q. Now then, Captain, just look at Oregon's Exhibit No. 5, and tell me whether it also, at the date of that map, which is 1854, there was not a north channel and the north channel ran north of Sand Island?

A. Yes. 1854, that channel at that time was running north of Sand Island.

Q. Now, you may tell me whether the north and the south channel crossed the bar in different places and entered the ocean in different places at that time.

A. They did on this map, yes sir. They are represented in two different entrances on this map.

372 Q. You may state whether you know of any later map being published prior to the admission of Oregon into the Union in 1859, than that map of 1854?

A. I don't think I could, my recollection don't cover that.

Q. If there is no later map, then Congress must necessarily have had reference to the map of 1854 in passing the act creating Oregon as a state and fixing its boundaries, presumably, did it not?

Mr. MACDONALD: It is pretty hard to ask the witness what Congress had in mind then.

A. I cannot answer the other question upon which you base this one, that is, in regard to this being the latest publication. As far as anyone after that, I couldn't say.

Q. I think the testimony by the engineers shows that there is no other map later than this.

A. Until the Coast Survey map.

Q. Until after Oregon was admitted into the Union.

A. That was, you say, in '59?

Q. Oregon was admitted in '59.

A. Oregon was admitted in '59. Yes, I would have to study it up a little. On the points of history, I couldn't give the testimony of my own knowledge, but if that was the latest map, your surmise in that statement, that it was probable, Congress had this map under discussion, may be right. I could not testify as to that.

373 Q. Now, Captain, when you stated that the 1854 channel, where the mouth of it was, as exhibited on Washington's exhibit H, you then did not realize that the 1854 north channel entered the ocean at a different place from the south channel, did you?

A. Allow me, before I answer those questions, to know which one Washington's Exhibit H is; otherwise, I might get mixed up.

Q. (Last question read to the witness).

A. I did not realize it?

Q. No.

A. Well, I don't know why I didn't realize it.

Q. Well, did you?

A. Well, now, you will have to ask that question again; I haven't got it right in some way.

Q. (Former question read to witness).

A. I will ask to have my statement read.

Q. When you told where this channel was, the mouth of it, I want to know whether you had in mind at that time, that the two channels came together, or whether you thought they did not.

A. I don't think I had anything about it in my mind. My statement was that I considered where it entered the ocean, is the mouth of the channel, not some point up the river above it, but at the bar where it goes out to the Pacific Ocean.

Q. Now, Captain, then you considered that where the waters of the river entered the ocean, is the mouth of the river channel, did you?

A. Yes sir. It may not be the mouth of the river, but it is the mouth of the channel, undoubtedly.

Q. The mouth of the river channel?

374 A. Yes sir.

Q. And where the river channel if it continues over the bar, then it becomes a bar channel, doesn't it, and is known as the bar channel by pilots?

A. Yes sir.

Q. And sea going men generally?

A. Yes, as the bar channel.

Q. Now, what do you understand by the term the channel of the river, or ship channel of the river?

A. I understand that it is the channel occupying the river between a line drawn across between the heads of that river, the north and south or east and west head, as the case may be, between the two heads. Inside of that line would be a river channel and outside of that would be a bar channel.

Redirect examination.

By Mr. MACDONALD:

Q. The Attorney-General has asked you certain questions with reference to Oregon's Exhibits 4 and 5, and the Wilkes Map, and your answers were, then, that the north channel ran north of Sand Island. By that, you meant Sand Island as it existed at those respective dates?

A. Undoubtedly that is what I meant.

Q. And not as it exists at the present time?

A. No sir. Not having been here at the time of Commodore Wilkes' survey, I took my testimony and my judgment from what I know of the exhibit, of the map.

Q. Captain, I think you have already testified that in your

375 opinion the south channel was the main ship channel, as shown by the map of 1851, the hydrography of 1851?

A. Did I testify that the south channel was the main ship channel of 1851?

Q. I so understood you. This is the same one that is on the others in colors (indicating).

A. I was not here in 1851.

Q. I mean, as shown by the map.

A. As shown by the map, I presume that is correct.

Q. Captain, I want to ask one more question, with reference to the nature of the sands on that section of the river between Three Tree Point and Tongue Point, as to whether or not they are shifting in character, and have moved since your knowledge of the river.

A. They are shifting constantly, I presume always, have been shifting since I knew them.

Q. Attorney-General Crawford asked you the purpose of the construction of that dike from Snag Island across Cordell channel, and I understand you to give as your opinion, that the purpose of that was to throw the water into Woody Island channel.

A. Yes sir.

Q. I wish you would state what the result of it was, and whether the expactations of the government officers were fulfilled.

A. That I would not be able to state of my own knowledge, but I presume it did not fulfill the expectations on account of the
376 efforts to open the north channel.

Q. It was not the result, then, that Woody Island channel was opened up to commerce as a commercial channel by the building of that jetty?

A. According to my recollection, it was not.

Q. But, on the contrary, the north channel was improved from that time on.

A. Yes.

Q. Together with the dredging done by the government?

A. Together with the dredging, yes.

(Witness excused.)

Mr. MACDONALD: We have nothing further.

Stipulation.

It is hereby mutually agreed and stipulated by and between the parties hereto, that either party may produce and file with the Clerk of the Supreme Court in this case, duly certified copies of any public records whatever which they deemed pertinent or competent as testimony, and that in that event a copy thereof be served on the opposite counsel.

We respectfully ask that the Court grant and observe this stipulation.

377 In the Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Oath of Shorthand Reporter.

STATE OF OREGON, *County of Multnomah, ss:*

I, John H. Pelletier, do solemnly swear that I will support the Constitution and laws of the United States; that I will truly, faithfully, and correctly report in shorthand writing and transcribe into typewriting all the testimony and proceedings in this cause, wherein the State of Washington is complainant and the State of Oregon, defendant, so help me God.

J. H. PELLETIER.

Subscribed and sworn to before me this 13th day of September, 1906.

C. C. DALTON,
Commissioner on the Part of the State of Washington.

378 In the Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
vs.
STATE OF OREGON, Defendant.

Certificate of Shorthand Reporter.

UNITED STATES OF AMERICA,
State of Oregon, County of Multnomah, ss:

I, John H. Pelletier, do hereby certify that I was appointed by the respective parties to the above entitled cause, to report the testimony and proceedings therein; that I was present at the examination of all of the witnesses on behalf of the plaintiff, as herein set forth; that I made in shorthand writing a complete and accurate report of the proceedings and of the testimony of all of such witnesses, and that the foregoing pages are a complete and accurate transcript of my shorthand notes taken therein.

J. H. PELLETIER.

Dated at Portland, Oregon, September 17th, 1906.

379 In the Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
vs.
STATE OF OREGON, Defendant.

Commissioners' Certificate.

UNITED STATES OF AMERICA,
State of Oregon, County of Multnomah, ss:

I, C. C. Dalton, and I, John W. Reynolds, do each hereby certify that said C. C. Dalton now is and at all the times since the 10th day of July, A. D. 1906, has been, a Notary Public duly commissioned by and for the State of Washington, and that said John W. Reynolds is now and at all times since the 10th day of July, 1906, has been a Notary Public duly commissioned by and for the State of Oregon.

That both of us, the said C. C. Dalton and John W. Reynolds, have been, in pursuance of stipulation herein, duly agreed upon and appointed by said States of Washington and Oregon, respectively, by their respective attorneys, as Commissioners jointly to take the testimony of the witnesses in the above entitled cause and to certify the same jointly to this Honorable Court. That each of us before proceeding to take the testimony herein, duly took and subscribed an oath to support the Constitution of the United States and faithfully and impartially to discharge our duties as such commissioners, which oaths are herewith filed.

That the foregoing deposition of witness on behalf of the complainant was taken before us jointly as such commissioners,
380 on oral interrogatory, between the hours of ten o'clock in the forenoon and four o'clock in the afternoon, at Portland, in Multnomah County, State of Oregon, on the date following, to-wit:

Deposition of Cleveland Rockwell, on Saturday, September 15, 1906.

That said deposition and testimony so taken were reported in shorthand writing by John H. Pelletier, the shorthand reporter duly agreed upon, and appointed by the respective parties to said cause, to report said testimony, and was by said John H. Pelletier, under our direction, reduced to typewriting, and the certificate of the said John H. Pelletier as to the correctness thereof, is hereunto appended.

That before proceeding to report said testimony, said John H. Pelletier was by us duly sworn to report and transcribe the same, truly, faithfully and correctly.

That before said testimony was taken, said witness was by us duly sworn to tell the truth, the whole truth and nothing but the truth.

That the reading and signing of said deposition by said witness was duly waived by stipulation of the parties hereunto, by their respective attorneys, which said stipulation is set forth in the record of said deposition.

That the foregoing is a true and complete transcript of the deposi-

tion and evidence taken before us on behalf of the plaintiff in
381 the above entitled cause, and of the whole thereof, and of all objections made thereto, and of the stipulations entered into between the parties during the progress of the taking of the testimony on behalf of the plaintiff, and consists of pages numbered 315 to 342 of the record of testimony taken before us in said case.

In witness whereof, we have hereunto subscribed our names and affixed our notarial seals this 17th day of September, 1906, at The City of Portland, Multnomah County, in the State of Oregon.

[Seal C. C. Dalton, Notary Public, State of Washington.]

C. C. DALTON,
Commissioner and Notary Public for the State of Washington.

Commission expires July 9, 1910.

[Seal John W. Reynolds, Notary Public, State of Oregon.]

JOHN W. REYNOLDS,
Commissioner and Notary Public for the State of Oregon.

382 In the Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Oath of Commissioner.

STATE OF OREGON, *County of Clatsop, ss:*

I, C. C. Dalton, do solemnly swear that I will support the constitution and laws of the United States and will faithfully and impartially discharge the duties devolving upon me as commissioner on the part of the State of Washington in the above entitled cause. So help me God.

(Signed) C. C. DALTON.

Subscribed and sworn to before me this 11th day of July, A. D. 1906.

[SEAL.] J. C. CLINTON,
County Clerk of Clatsop County, State of Oregon, and ex-Officio Clerk of the Circuit Court for Said County.

383 In the Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Oath of Commissioner.

STATE OF OREGON, *County of Clatsop, ss:*

I, John W. Reynolds, do solemnly swear that I will support the constitution and laws of the United States and will faithfully and impartially discharge the duties devolving upon me as commissioner on the part of the State of Oregon in the above-entitled cause. So help me God.

(Signed) JOHN W. REYNOLDS.

Subscribed and sworn to before me this 11th day of July, A. D. 1906.

[SEAL.] J. C. CLINTON,
County Clerk of Clatsop County, State of Oregon, and ex-Officio Clerk of the Circuit Court for Said County.

384 Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Record of Testimony on Behalf of State of Oregon.

Now, on this 11th day of July, 1906, in pursuance of the stipulation of the parties heretofore filed herein, and by mutual agreement of the parties, the taking of testimony on the part of the defendant in the above-entitled cause was commenced at the City of Astoria, in the County of Clatsop, State of Oregon, before Hon. John W. Reynolds, Commissioner on the part of the State of Oregon, and Hon. C. C. Dalton, Commissioner on the part of the State of Washington;

Counsel on the part of complainant being E. C. Macdonald, Assistant Attorney General of the State of Washington, and John T. Welsh;

Counsel on the part of defendant being Hon. A. M. Crawford, Attorney General of the State of Oregon; U. S. Senator Chas. W. Fulton; Harrison Allen, District Attorney of the Fifth Judicial District, State of Oregon; and C. H. Abercrombie, Deputy District Attorney of the Fifth Judicial District, State of Oregon.

Robert S. Taylor was sworn to truly, faithfully and correctly report in shorthand writing and transcribe into typewriting the testimony and proceedings.

Thereupon the following proceedings were had and the following testimony introduced:

Counsel for the State of Oregon offered in evidence map of Oregon Territory, made by U. S. Exploring Expedition in 1841, Charles Wilkes, Esq., Commander. The same was marked Oregon's Exhibit No. 1, and signed by the Commissioners.

385 Counsel for the State of Oregon also offered in evidence Sheet No. 1, Mouth of the Columbia River, Oregon Territory, Surveyed by the United States Exploring Expedition, Charles Wilkes, Esq., Commander, 1841.

The same was marked Oregon's Exhibit No. 2, and signed by the Commissioners.

Counsel for the State of Oregon also offered in evidence Sheet No. 2 of Columbia River, from Astoria to Kathlamet Head, by the United States Exploring Expedition, 1841.

The same was marked Oregon's Exhibit No. 3, and signed by the Commissioners.

Counsel for the State of Oregon also offered in evidence map or print of Mouth of Columbia River from a preliminary survey under the direction of A. E. Bache, Superintendent of Survey of the Coast of the United States, by the Hydrographic Party under the Command of W. P. McArthur, Lieutenant U. S. Navy, Assistant U. S. Coast Survey; W. A. Bartlett, Lieutenant U. S. Navy, Assistant, published in 1851.

The same was marked Oregon's Exhibit No. 4, and signed by the Commissioners.

Counsel for the State of Oregon also offered in evidence map or print U. S. Coast Survey, A. D. Bache, Superintendent; Entrance to Columbia River, Oregon; Triangulation by R. D. Cutts, Asst. U. S. Coast Survey; Topography by the Party under the Command of Lieutenant James Alden, U. S. Navy, Assistant, 1854.

The same was marked Oregon's Exhibit No. 5, and signed by the Commissioners.

386 Counsel for the State of Oregon also offered in evidence map of Columbia River, sheet No. 1, entrance to Upper Astoria, published March, 1905.

The same was marked "Oregon's Exhibit No. 6," and signed by the commissioners.

Counsel for the State of Oregon also offered in evidence map of Columbia River, sheet No. 2, issued May 9, 1890, T. C. Mendenhall, Superintendent; verified by B. A. Colonna, Assistant in charge of office; date of first publication 1875.

The same was marked "Oregon's Exhibit No. 7," and signed by the commissioners.

Mr. MACDONALD: The State of Washington has no objection to the introduction of the seven maps just offered in evidence by the State of Oregon.

JOHN H. LEWIS, being duly sworn as a witness on behalf of the defendant, testified as follows:

Direct examination.

By Mr. CRAWFORD:

Q. What official position do you hold, if any, Mr. Lewis?

A. State engineer of the State of Oregon.

Q. State what experience you have had as an engineer and what preparatory training, if any.

A. I have had three years at the Stanford University in the civil engineering department; I have been for two years with the Oregon Railroad & Navigation Company in the engineering department; I studied for two years, graduating in 1903, at the College of Civil Engineering at Cornell University; I have been for practically two years with the United States Reclamation service on various
387 work in the State of Oregon; and I have been for a little over one year State Engineer of the State of Oregon.

Q. You may state whether you prepared a map, of which the one before you is a blue-print, and, if so, state what it shows and represents and from what records (if any) you prepared it.

A. I prepared in February, 1906, a tracing, of which the blue-print before me is a direct copy. This blue-print shows the outlines of the Columbia River as taken from the official government township plats. It also shows the lands which have been sold by the State of Oregon up to February, 1906, which lie in the Columbia River. The areas which are shown in solid lines are traced direct from the State Land Office records; those that are shown in dotted lines are platted direct from the deeds by myself. The boundary line as claimed by the State of Oregon is shown to the north of the land sold by the State.

Q. You may state whether you know said map to be substantially correct.

A. I believe this map to be substantially correct.

Mr. CRAWFORD: The State of Oregon offers this blue-print, Columbia River from Land Office plats, February, 1906, prepared by State Engineer Lewis, in evidence.

The same was marked "Oregon's Exhibit No. 8," and signed by the commissioners.

Mr. MACDONALD: The State of Washington has no objection to the introduction of this map.

Q. You may state whether you have with you a memorandum of the names and dates and deeds of lands and islands and sand-bars situated in the Columbia River and represented in "Oregon's Exhibit No. 8."

A. I have not.

Mr. CRAWFORD: I will supply the data a little later.

388 Cross-examination.

By Mr. MACDONALD:

Q. This faint line running across to the Washington shore of the Columbia River, which is marked "Boundary Line as claimed by Oregon," is in exact accord with the line on the map in the answer of Oregon, is it not?

A. Yes sir, it is.

Q. I observe here on one of these islands "D. H. Welch 136.35 Ac." Does that indicate the acreage of that particular tract of land?

A. Yes sir.

Q. I observe here "T. 348." Will you be kind enough to inform us what that indicates?

A. That refers to the deed number as designated on the records of the State Land Office.

Q. Then, all of these figures in these tracts indicate, first the acreage, and then the deed number or the book where they are recorded in the Land Office?

A. The figures followed by "A" represent acreage, and the other figures designate the deed—book and page.

Q. These lines on these tracts indicate the amount sold by the State or do they indicate the entire sand islands?

A. They indicate the boundaries of the piece of land as sold by the State.

Q. As sold by the State?

A. Yes sir.

Q. Sand Island is not shown on this map at all?

A. No sir, it is not.

Q. And you have only shown on this map the tracts of land which the State of Oregon has sold or made a contract of sale or lease for?

A. Which lie in the Columbia River. Those adjoining the main land are not shown.

389 Q. Just those in the Columbia River?

A. Yes sir.

Q. Do you know whether or not the State of Oregon has attempted to convey or sell any islands or lands in the Columbia River other than those which are shown on this map, Oregon's Exhibit 8?

A. I have placed upon this map the information to the best of my knowledge, which shows only the lands as sold by the State of Oregon.

Q. Do you know whether this map shows all of these sands and islands in the Columbia River?

A. No sir, it does not, because——

Q. I mean south of the line as claimed by Oregon.

A. Well, if any of them are of commercial value they probably have been taken up. In that case they are shown. If not taken up or purchased from the State they would not be shown.

Capt. H. P. KINDRED, being duly sworn as a witness on behalf of the defendant, testified as follows:

Direct examination.

By Attorney General CRAWFORD:

Q. Captain, where do you reside?
A. In Astoria, sir.
Q. How long have you resided here?
A. I came to this country in 1844, but I have resided in Astoria, made it my home, since 1873.
Q. Have you during your lifetime been a pilot?
A. On the river; I have been captain of a steamboat.
Q. Have you been a bar pilot also?
A. No sir.
Q. A river pilot?
390 A. A river pilot, yes sir.
Q. You may state whether you recollect as far back as 1854 to 1860 as to the situation of Sand Island, and as to whether there was any good ship channel entering the Columbia River north of Sand Island during those years.
A. I was not practically acquainted with it until 1863.
Q. State how it was in 1863.
A. There was a channel on the north side of Sand Island; also on the south. But the north side was the best channel, as I understood it.
Q. You may state, if you recollect, when the first tug commenced work in the Columbia River.
A. The first tug that commenced was the Raboni.
Q. What year?
A. I have forgotten exactly. It was in 1863 or 1864, somewhere along there; perhaps before that, I am not positive.
Q. You may state where that tug usually lay at that time to pick up vessels entering the river.
A. In Baker's Bay as a usual thing; they had a lookout at the lighthouse. When they saw a ship they went out.
Q. You refer to Baker's Bay on the Washington side?
A. Yes sir.
Q. And to the lighthouse at North Head?
A. Not the one at North Head, but the one at Cape Disappointment.
Q. You may state whether the channel entering the Columbia River north of Sand Island was the principal channel at that time.
A. Yes sir, it was considered the best, the deepest draught.

391 Cross-examination.

By Mr. MACDONALD:

Q. Can you state the relative position of Sand Island at the time you have just testified to, 1863, and the present time?
A. No, I can't, exactly. It is farther to the north. The distance I couldn't state, but it is a considerable distance farther.

Q. It is a fact, is it not, that Sand Island has moved a considerable distance towards the north since 1863?

A. Yes, sir, it has, to my knowledge.

Q. Could you approximate the distance?

A. No sir, I could not.

Q. Was it half a mile?

A. Oh, I should judge it was.

Q. Perhaps more?

A. Perhaps more; I don't know, I have no idea.

Q. I understood you to say that the channel north of Sand Island was the principal and best one in 1863.

A. That is what they said. I was not bar pilot at that time; I was in the Quartermaster's department, and we used to go down around there and it was always considered the best.

Q. Did you have occasion in the prosecution of your business to use that channel out to the open sea?

A. No sir.

Q. Do you know whether or not vessels from the open sea passed north of Sand Island in 1863 on their way up the river?

A. In 1863 and 1864 they did, yes sir.

Q. They used that channel north of Sand Island on their way up the river?

A. Yes sir.

Q. How close would you say they went to Cape Disappointment, these vessels going up the river?

392 A. They passed right close by, right close to the Cape.

Q. Did any of those vessels going to Astoria and Portland use the channel south of Sand Island at that time?

A. They occasionally did, the vessels of lighter draught. Those of deeper draught used the north side.

Q. Do you know whether or not vessels coming from the open sea on their way to Astoria and Portland now go north of Sand Island?

A. At the present time?

Q. Yes.

A. No sir, I believe not.

Q. It is a fact, is it not, that all vessels coming from the open sea to Astoria and Portland, or going out, use a channel very far south of Sand Island?

A. Yes, they use the south side of Sand Island; that is right.

Q. And it is a fact, is it not, that no sea-going vessel can pass north of Sand Island at low tide at the present time?

A. I think not, sir; I don't think they can. I haven't sounded. I don't know anything about the sounding.

Q. It is a fact, is it not, that the channel north of Sand Island at the present time, at low tide, does not exceed three or four feet in depth?

A. I couldn't say as far as the depth is concerned; it is not used practically. As to the depth I couldn't say.

Q. Have you had occasion to go over it recently?

A. No sir.

Q. When did you pass over the channel north of Sand Island last?

A. I have not only as a passenger; I was down on the Nahcotta passenger boat.

Q. Do you know how long it is since the channel north of Sand Island was abandoned by sea-going and other vessels and steamers?

393 A. No sir; the exact year I couldn't state.

Q. Could you approximate it?

A. 1878 or somewhere along there.

Q. About the year 1878?

A. Somewhere about there; it might be as late as 1880; I couldn't say. I have been on the Upper River since 1871.

Q. And since that time the channel has not been used by vessels going from the sea up the river?

A. The north side, no sir; I believe not, sir, as far as I have known.

Redirect examination.

By Mr. CRAWFORD:

Q. You may state whether Sand Island, which you say has moved to the north, has merely been by accretions on the north side of the island.

Mr. FULTON: Building out.

A. It has naturally gone north or filled in there, I suppose. Sediment has caused it.

Q. What I mean by the question is, whether sediment has formed on the north side of the island.

A. Yes sir, I should judge that it had. It is shoaled up there; the island has naturally gone too. The part that is dry is farther north than it used to be.

Q. The island, you think, is really nearer the Washington shore?

A. Yes sir.

Q. The Washington shore line has not (or has it?) built up further south, or is it about in the same condition it was in 1860 to 1864 when you went there?

A. The shore line is, I suppose, as near, but this sediment has formed in there and shoaled that up.

By Mr. MACDONALD:

Q. All of the water north of Sand Island has been constantly getting more shoal in the last twenty years, has it not?

A. Yes sir, as far as I have noticed it.

394 Capt. P. E. FERCHEN being duly sworn as a witness on behalf of the defendant, testified as follows:

Direct examination.

By Mr. CRAWFORD:

Q. Where do you reside, Captain?
A. Well, I have been here since the fall of 1855.
Q. That is, you have resided in Astoria since 1855?
A. Yes.
Q. You may state what your occupation is.
A. At the time I came here, sir, I was on the bar; came here for that purpose. I was employed on the pilot boat on the Columbia River bar for one year or a little over.
Q. In what year?
A. The fall of 1855 and part of 1856. I was employed there a year or a little over a year.
Q. You may state in regard to there being a channel or otherwise north of Sand Island at that time.
A. Yes, there was a channel north of Sand Island. In certain winds we preferred that channel. There was just as good a channel on the north of the Island as on the south.
Q. You may state how many channels there were over the bar at that time.
A. Two channels.
Q. And what were they called?
A. North and south.
Q. You may state through which channel the shipping mainly entered the river.
A. Well, as I said before, there was no choice; it was just owing to the winds and tides; we had to have certain winds. For instance,
395 in a strong northeast wind the south channel was used. In summer more particularly the north channel was used. The northwest wind was such that you could not sail in without making a tack with the vessel because the channel was in such form that it was south, all south.
Mr. FULTON: In a northwest wind you would come in at the north channel?
WITNESS: The north channel, yes sir.

Q. You may state, Captain, whether you were also a pilot up the river.
A. I never was pilot on the bar, but I afterwards became river pilot—in 1871.
Q. In 1871?
A. Yes.
Q. And up to that time you had been a bar pilot?
A. No, not a bar pilot, but employed on the boat.
Q. Oh, employed on the boat?
A. Yes.
Q. In 1855 and for a number of years thereafter, I understood you to say there were only two channels across the bar?

A. That was all that I know.

Q. You may state whether at that time there was anything known as or called the middle channel?

A. The middle channel?

Q. Yes.

A. Not when I was on the bar.

Q. And was there any middle channel up the river after you commenced to run up the river?

A. You are speaking of the river or bar?

Q. I am asking you now about the river; whether there was any up the river, and if so where it was; how far up the river did you have to go before you came to it.

A. It was just about Tongue Point.

Q. You may look at this map, Oregon's Exhibit No. 7, and state where the north channel was at that time.

396 A. The north channel?

Q. Yes.

A. There was no north channel.

Q. You may look at this map of 1851 first, Oregon's Exhibit No. 4, showing the mouth of the river, and state where the north channel was located south of Point Ellice, if you recall and were acquainted with the river there at that time.

A. I wasn't here in 1851.

Q. I know, but show on the map where it was in 1855 to 1860 after you came here.

A. That is Point Ellice. Here is Chinook. Off this point was almost a straight line to Cape Disappointment, on the north side of Sand Island—almost a straight line. That channel we had nothing to do with, mind you. This is Chinook, this is Washington. When I was on the pilot boat we didn't come any farther than here. (Pointing on map.)

Q. State the point. What do you mean by "here"?

A. Where Fort Columbia is today. We never got any farther up the river than from there out to Cape Disappointment. There was not a variation in the course there; it was perfectly straight. Left Sand Island quite a distance to the south.

Mr. FULTON: You mean practically straight from Chinook Point?

WITNESS: Yes.

Mr. FULTON: From Chinook Point to the Cape?

WITNESS: Yes, to the Cape.

Q. Now, Captain, in 1860, in going up the river from Point Ellice where was the north channel?

A. I don't know anything above there.

Q. You don't know anything above that?

A. No.

397 Cross-examination,

By Mr. MACDONALD:

Q. Captain, what was your business when you were on the bar?

A. I was a seaman part of the time, and then another part of the

time I was a boat-keeper—a man that when all the pilots had gone away he would take charge of the boats.

Q. Did you have occasion to study the various channels across the bar while wou were working there?

A. Oh, yes, certainly. If there was any more channels there that was our business to find what they were.

Q. It is a fact, is it not, Captain, that you used the south channel coming in and going out just about as much as you used the north channel described by you?

A. That was about the same; just as the wind and weather permits. Of course sometimes one was better than the other.

Q. As I understand you, when you had a northwest wind you used the north channel?

A. Yes, because it was handier and straighter than the other.

Q. Now, it is a fact that in stress of weather it was a customary thing for vessels to come in and anchor towards the north of the Cape so they would be sheltered?

A. Yes; in case a vessel was going out and there was no chance to get out, in order to keep them close at hand they were anchored in Baker's Bay at that time. In stress of weather coming in it would not have made any difference in either channel.

Q. I understood you to say that the channel was almost a direct course from Chinook Point to the Cape.

A. Yes; it was almost a straight line.

Q. Almost a straight line?

A. Yes.

Q. Sand Island was to the south of that channel?

A. Yes; Sand Island was to the south.

398 Q. Are you now engaged in piloting on the river, Captain?

A. Yes. I am about quit. I am getting too old. But I have been there for thirty-five years.

Q. Are you now bar pilot or river pilot?

A. No, I am neither one nor the other. Well, I am still yet under United States license. I am a steamer pilot yet as long as I have my license, but I am not doing any business.

Q. Do you know where the present channel is, used by sea-going vessels from the open sea to Astoria and Portland and going out again?

A. Yes; my part of the business I know.

Q. Where is the present channel that is used by vessels, as I have described?

A. Going up the river?

Q. Yes.

A. Goes from Tongue Point, and from there——

Q. I mean from the ocean.

A. Oh, the ocean?

Q. From the ocean to Astoria.

A. Oh! On the Oregon side, and always went on the Oregon side as long as I know.

Q. It is away down close to the bank of Oregon—the north bank of Oregon—is it not?

A. Yes.

Q. And this channel you speak of as having been used from Chinook Point to the Cape is not now used at all?

A. It don't seem to be.

Q. The fact of the matter is, is it not, that Sand Island has moved a long distance towards the north in the last forty years?

A. It has, undoubtedly.

Q. And the channel between Sand Island and the Wash-
399 ington shore cannot be used by ocean-going vessels or steamers?

A. Not now it cannot, no sir.

Q. And has not been used for a number of years?

A. No.

Q. Do you know the depth of the channel north of Sand Island at low tide?

A. Now?

Q. Yes.

A. No, I do not.

Q. It is a fact, is it not, that it is only three or four or five feet?

A. It must be more than that.

Q. I mean at low tide.

A. Yes, it is about that.

Q. About that at extreme low tide?

A. Yes.

Q. Can you tell when that old channel that you have testified about, from Chinook Point to the Cape, was abandoned—when they quit using it?

A. No; but this channel from the Cape, ships didn't go the whole length of it; but there was a channel from there straight to the Cape. Ships didn't have to go that far because there was a channel then all around.

Q. The ships didn't go clear over to Chinook Point, then?

A. No, they didn't go that far. They could go but they didn't.

Q. When they left the Cape they bore off to the south so that they could come in and touch at Astoria, did they not?

A. Yes; they go south a little.

Q. Are you familiar with the location of Desdemona Sands?

A. Yes.

Q. I will ask you whether or not this island shown in here on Oregon's Exhibit No. 4 and marked "Bare at low water,"
400 shows the location of Desdemona Sands?

A. Today?

Q. Yes.

A. I beg your pardon. I want to tell you, speaking about the Desdemona Sands, it was the year I came here or the year after that the Desdemona was wrecked on that sand, and I myself helped to take the crew off; but that sand has moved.

Q. What year was it that the Desdemona was wrecked?

A. That was in 1856.

Q. And you say that Desdemona sand has moved since that time?

A. Yes.

Q. To the north?

A. It has moved down—out; down the river.

Q. Now, Captain, this map, Oregon's Exhibit No. 4, was prepared in 1851 and shows the condition of things at that time. I will ask you whether or not Desdemona Sands then appeared at the point which I am indicating on this map marked "Bare at low water"?

A. What is the point?

Q. Here is Point Ellice, here is Chinook Point, and here is the Cape. (Pointing on map.)

A. Desdemona Sands at that time, at least that part which was out of water, was right opposite the Hotel Flavel—right opposite there.

Q. Assuming that this sand here, marked "Bare at low water," correctly shows the position of Desdemona Sands, I will ask you to state whether or not vessels, in coming from the open sea to Astoria and Portland, pass to the south or pass to the north in going up the river.

A. They will pass to the south.

Q. They will pass to the south of Desdemona Sands?

A. Yes, certainly. Very little of it come out dry, though, at that time.

401 Q. Where is that hotel you speak of?

—. The hotel is pointed out on the map.

Q. Now, Captain, on Oregon's Exhibit No. 4 pointing to the words "Tidal Station" I will ask you to state how far from those words would this hotel Flavel appear on the map.

A. Across the channel; I couldn't tell you the width of the channel; right across.

Q. Listen to me, Captain. Do you see these two words down here? Put on your glasses and look down here. Do you see those two words "Tidal Station"?

A. Yes.

Q. Now can you tell us where the Hotel Flavel would be?

A. "Tidal Station" I don't know that either.

Mr. Lewis marked on Oregon's Exhibit No. 4 "Tansy Point."

Q. Captain, I call your attention to a point on the Oregon shore which has just been marked by State Engineer Lewis as Tansy Point.

A. Yes.

Q. I will ask you to state how far the Flavel Hotel is from that point.

A. From Tansy Point?

Q. Yes.

A. Well, that is included in the point. Tansy Point is the place where the Hotel Flavel is situated.

Q. Now I will ask you to inform us how close to Tansy Point vessels would be in going up the channel from the sea to Astoria.

A. They would go within 150 feet of the bank.

Q. And they usually did go within 150 feet in passing up to Astoria?

A. Yes; sometimes closer when necessary.

Q. Would the deepest part of that channel be within 150 or 200 feet of Tansy Point?

A. Across?

402 Q. I mean the channel that they used to use going up the river.

A. How far from Tansy Point?

Q. The deepest part of the channel.

A. Oh, the deepest part?

Q. Yes.

A. Oh, 400 or 500 feet from the shore.

Q. But, as you said just a moment ago, vessels frequently went within 150 or 200 feet of Tansy Point in going up to Astoria?

A. Yes. A ship cannot always make a straight line.

Q. And that was the usual route in going to Astoria?

A. Yes, that was the only way.

Q. What years were those?

A. Speaking about the——

Q. You say this was the only way.

A. That was in 1856 when the vessel was wrecked there. 1856, 7 and '8, somewhere along there.

Q. How long did sea-going vessels and steamers continue to use this channel here close to Tansy Point in going to Astoria?

A. Until today; they use it now.

Q. So they have used it from the time you first became acquainted with the channel continuously to the present time?

A. Certainly.

Mr. CRAWFORD: Let the record show that the State Engineer (Mr. Lewis) by request places Fort Stevens on Oregon's Exhibit No. 4, from memory.

Q. Now, Captain, I will call your attention to a little cross on the south bank of the Columbia River which has just been marked by State Engineer Lewis as Fort Stevens, and ask you if you are familiar with the location of Fort Stevens.

A. Well, Fort Stevens is there today, isn't it?

403 Q. Well, you are familiar with the location?

A. Yes.

Q. Do you know when Fort Stevens was built there?

A. That was in the '60s anyhow. During the Rebellion. I don't know the date or the year particularly. My memory don't serve me as well as it used to.

Q. To refresh your memory, Captain, is it not a fact that Fort Stevens was constructed about 1864?

A. Somewheres in that neighborhood, yes.

Q. I will ask you to state how close to Fort Stevens did vessels pass in going from Portland and Astoria to the open sea.

A. If I knew the extent of the water I could probably say, but according to that I couldn't say. They would go say within 500 feet of Fort Stevens, I suppose, at that time.

Q. Then, I understand you to say that sea-going vessels in passing from Portland and Astoria out to the Pacific ocean customarily and

habitually used a course which took them within, say, 500 feet of Fort Stevens?

A. Yes; 500 feet or more. Of course they could hit within 500 feet or they could be 1000 feet. As I said before, vessels can't always go straight. A vessel can't always go where it wants to. Consequently there was plenty of room there. But that is what I say is the limit I would allow a ship to go.

Q. They did go within 500 feet?

A. Yes.

Q. How close did these sea-going steamers usually go?

A. Probably a quarter of a mile.

Q. About a quarter of a mile?

A. Yes.

Q. You think, Captain, that they ordinarily and customarily went about a quarter of a mile from Fort Stevens in going to the sea?

404

A. Yes, when they go a straight line. Take a steamer, I should judge that was the line.

Q. Captain, where do you reside?

A. Right here.

Q. Right in Astoria?

A. Yes. Been here 45 years.

Q. Do you expect to be in the city for the next two or three weeks?

A. Yes, I am in the city all the time.

Mr. MACDONALD: It is possible we may desire to recall the Captain as a witness later on.

Redirect examination.

By Mr. CRAWFORD:

Q. Captain, you may state whether, during the times you have been testifying about that ships entered the mouth of the Columbia River through the north channel, it was necessary for them to come to Astoria at all if they were bound to Portland only.

A. Whether they need not to go to Astoria?

Q. Yes.

A. No, not to my knowledge since I have been here. They had to go to Astoria. That is, you are speaking about ships. When I speak about ships, I mean ships that at that time were ships and drew so much water.

Q. How much water would a ship draw?

A. Thirteen or fourteen feet. A ship that drew thirteen or fourteen feet had to come to Astoria.

Q. Could a ten-foot ship get up on the other side, the north side, the north channel?

A. A ten-foot ship might. A ten-foot might go over.

Q. When did you say you first came to the river—in 1855?

A. Yes sir.

Q. And Sand Island, you say, has moved since that?

405

A. Yes, Sand Island has moved about the size of it.

Q. You may state whether it has mostly moved since the com-

mencement of the building of the jetty from the Oregon shore, or prior to that.

A. Well, I couldn't say. My business then, of course, didn't call me there, but I know the middle of the channel, where I come out many a time, the middle of the north channel, and I know the mark of the light-house. As long as the lighthouse was there I have known my mark when I used to go with the ship. There are trees growing on the island now. The whole thing is all closed up. There isn't anything there.

Q. What island do you refer to?

A. Sand Island.

Q. And there were trees on it then?

A. No, not then; but there is now where the deep water used to be.

Q. Oh, yes, there are trees there now?

A. Yes, there are little trees growing on it now.

Q. That has built up from the island by sediment?

A. Yes, into Baker's Bay.

Q. You may state whether on the north side of that island and around where the channel used to be a great many fish traps have been placed.

A. Yes, there is lots of them now.

Q. How many years have fish traps been placed in there, and other stationary fishing gear?

A. I couldn't tell you, sir. As I said before, I am just speaking about my experience when I was there, and when my experience and business was there I know about it; but when the first fishing trap was put in I don't know anything about it.

Q. When did you first begin to go up the river, did you say?

406 A. I got to be pilot in 1871.

Q. In 1871; that was after the admission of Oregon as a state into the Union?

A. Yes.

Q. You may state whether you had occasion to run up to Point Ellice frequently?

A. Point Ellice?

Q. Yes; as far as that up the river.

A. Point Ellice was down the river.

Q. Oh, yes. You ran up the river farther than Point Ellice?

A. From Astoria?

Q. No, in the north channel.

A. In the north channel. Of course, as I say, I never took any ships there.

By Mr. FULTON:

Q. Coming in over the bar, the bar of the north channel, you say that you would sail up to a point off Chinook Point?

A. Yes. Where the fort is now.

Q. Marked here "Chinook Point"?

A. Yes.

Q. Then you would go across——
A. Yes.
Q. — to the Oregon side?
A. To Fort Stevens.
Q. As a matter of fact, the deep water continued, however, on up along the Washington shore, did it not?
A. Yes.
Q. And there was a regular deep ship-channel there, was there not?
A. That is Point Ellice?
Q. Yes. You state that when you would arrive with your ship at a point off Chinook Point, you would cut across to the Oregon side.
A. Yes sir.
Q. Now I ask you if as a matter of fact a deep channel did not continue from Chinook Point up along the Washington shore?
A. Well, I never took a ship there.
Q. But you knew there was a deep channel?
407 A. Yes; there was a deep channel, yes. I could see from there to here at that time.
Q. You mean from Point Ellice?
A. Yes.
Q. You know from Point Ellice to Chinook Point there was a deep-water channel?
A. Yes.
Q. Sufficient for deep-draught sea-going vessels, was there not?
A. Well, I don't know; I couldn't say that; I never had one there.
Q. Never tried it?
A. No.
Q. But you know as a matter of fact there was a ship-channel there?
A. There was deep water. I never measured it.

By Mr. CRAWFORD:

Q. It is marked on the map as being 7¼, 5 1/5, 5, fathoms in depth. Would that be considered a good deep ship-channel?
A. It would.

By Mr. FULTON:

Q. The reason you cut across, then, to the Oregon side was because, in the first place, the custom house was located at Astoria, was it not?
A. Yes, the custom house, certainly.
Q. And the ships coming in had to go to Astoria?
A. Had to go to Astoria. Couldn't get them up any other way.
Q. The ships had to go over there to enter, did they not?
A. Yes.
Q. At the customs house?
A. I suppose so.
Q. And it was simply the practice to go by that route as the most convenient?
A. Yes.

Q. Is that not the fact?
A. Certainly.

408 Recross examination.

By Mr. MACDONALD:

Q. There was no other way for deep sea-going vessels to go up river except close by Astoria?
A. There was what?
Q. There was no other way to go except around by Astoria?
A. Not to my knowledge there wasn't.
Q. Now you spoke of a deep ship-channel from Chinook Point to Ellice.
A. I said I never had a ship there, but I know there was deep water.
Q. Deep water from Chinook Point to Point Ellice?
A. Yes.
Q. Now, supposing a vessel had gone from Chinook Point to Point Ellice (and I speak of a deep-sea vessel), could she have gone from Point Ellice up the river?
A. I don't know. I couldn't say because I haven't tried. My business was such that I didn't try. I didn't sound the water.
Q. Did you ever know of a sea-going vessel or steamer coming from the open ocean passing up by Chinook Point, then by Point Ellice, and continuing on to Portland along the north bank of the river?
A. Well, I see now and have seen ships passing up there. That is all I see. I couldn't tell what kind of a channel there is. There is a channel that ships pass up. The quarantine is there. They take ships up there now. In my time, when I was on the river, they didn't know any channel there.
Q. Do I understand you to say that ocean-going vessels or steamers can pass Chinook Point and Point Ellice and continue on close up here to the Washington shore?
A. No, I didn't say anything of that kind.
Q. Well, I misunderstood you, then, Captain.
409 A. I just said that there was water from here to there, to my knowledge. (Pointing on map.)
Q. There is deep water from Chinook Point to Point Ellice?
A. Yes; and there was water also here, but for ships I couldn't say anything about it.
Q. You never saw ships following the Washington shore above Point Ellice?
A. No.
Q. And so far as you know all ocean-going vessels and steamers passed close by Astoria on their way up the river ever since you have known anything about the river?
A. Yes. What?
Q. I say all ocean-going vessels and steamers used this channel past Tansy Point and up past Astoria ever since you have known anything about the river?

A. Yes. That is the only way I ever went, and of course I speak by my experience and where I have been.

Q. And your observation?

A. Yes; where I have been and my experience and observation, what I know.

Q. And that is the case at the present time—that all ocean-going steamers and vessels pass right up close here to Astoria?

A. That is what they do.

Q. *In* vessels in passing up to Portland pass in this channel within half a mile of the bank at Astoria, don't they?

A. Half a mile?

Q. Yes.

A. Yes, I suppose so. I never measured it.

Q. Well, what would you estimate the distance to be of the vessels that were passing up here to Portland—big vessels? How far would they be from the wharves down here when they are passing?

A. About 600 yards, I suppose.

410 By Mr. CRAWFORD:

Q. How old a man are you, Captain?

A. I am 72.

Q. How long since you have been actively engaged in piloting on the river?

A. Since I quit, positively quit piloting, is a year or two years.

By Mr. FULTON:

Q. Astoria is the only point on the Columbia River at which vessels can now enter or clear, and was the only point during the early experience you mentioned, which you had on the river, where vessels could enter and clear, is it not?

A. Yes; it always was since that time, since I come here; it is a port of entry now.

By Mr. MACDONALD:

Q. Vessels can enter and clear at Portland, too, can they not?

Mr. FULTON: That is not on the Columbia River, you know.

WITNESS: Not until they get here.

Q. There is a custom-house too at Portland, is there not?

A. When I first came here they had none.

Q. Have they now?

A. They have now.

Q. Now, all of the steamers and ocean-going craft that go further up the river than Astoria all go to Portland, don't they?

A. Yes, most of them go to Portland; once in a while there is one comes and stays half ways or something like that.

Q. But all the ocean-going passenger steamers in passing up the river go to Portland, don't they?

A. Yes.

Q. All those steamers use this channel here, passing within 500 or 600 feet of the wharves of Astoria?

A. Yes.

411 Q. And have during all the years you have been here?
A. Yes. That is supposed to be pretty close but they can come here.
Mr. FULTON: That is supposed to be pretty close, but they can come here; is that what you mean?
WITNESS: Yes. I never measured it.

(Adjourned until 2 o'clock P. M.)

412 Capt. M. D. STAPLES being duly sworn as a witness on behalf of the defendant, testified as follows:

Direct examination.

By Mr. FULTON:

Q. Capt. Staples, where do you reside?
A. Astoria.
Q. What is your age and occupation?
A. Age 60; occupation, pilot.
Q. Engaged in piloting where?
A. On the Columbia River bar.
Q. How long have you been engaged in the occupation of a pilot on the Columbia River bar?
A. Most of the time since 1867. I came here in 1867.
Q. When you first entered upon that occupation how did you find the channels at the entrance or mouth of the Columbia River to be; where located, etc.?
A. The north channel around Cape Disappointment; that is where the channel used to come. When we saw a vessel we would go out and bring it into Baker's Bay.
Q. What did they call that channel?
A. The north channel.
Q. The north channel?
A. Yes sir.
Q. That ran in near to Cape Disappointment, you say?
A. Right close up under the Cape, yes sir.
Q. How near would it approach the Cape, approximately?
A. Right close to it; go right close up under it if you had to—ght close to it.
Q. Then what was the course of that north ship-channel up the river with reference to Sand Island, I will say?
A. We had a mark; you could go right straight up toward Point Ellice that way.
Q. Would you go on the north or south side of Sand Island; that is, on the Oregon or Washington side of Sand Island, at
413 that time? *at that time?*
A. We used to go on the Washington side.
Q. On the north side?
A. On the north side, yes sir.
Q. Now, from Point Ellice how was the channel?
A. The channel is a good channel right from there up to Knappton. That is where we used to haul ships, right in that way

Q. From Knappton where would you take a ship if you were going on up the river?

A. There used to be a channel right straight up where you speak of, but I wasn't acquainted up that way. When vessels wanted to go through to Portland they would take them up along that way.

Q. Right along the Washington shore?

A. Yes. I never went there though, but I have seen river boats there.

Q. You were not a river pilot?

A. No sir.

Q. Is there any other port where there is a custom house on the Columbia River other than Astoria, and was there any at that time?

A. What is that?

Q. Was there any other port at that time, or is there now, on the Columbia River where there is a customs house where ships may enter and clear, other than Astoria?

A. Nothing.

Q. Was there a south channel of the Columbia River as well?

A. Yes sir, but we didn't use it much; there wasn't much water there then.

Q. But there was a south channel?

414 A. Yes sir, there was a south channel, but there wasn't much water in it. The north channel was the best for our ships. There was more water. When we had a deep-draught ship we would take them into Baker's Bay and leave them there.

Q. After you got inside of the bar was there a south channel or a channel on the Oregon side?

A. Yes sir.

Q. Then there were two distinct channels—the south channel and the north channel in the Columbia River?

A. Yes sir. But the principal channel those days was the north channel.

Q. Now with reference to Desdemona Sands or the one that is marked here "Bare at low water," on Oregon's Exhibit No. 4, being the tract that is immediately off the point marked "Tansy Point," where did the vessels go at that time—north or south of that—in coming to Astoria?

A. They would go south of Desdemona Sands.

Q. They would go south of Desdemona Sands?

A. Yes sir.

Q. That is when you would come across?

A. Yes.

Q. But if they were going on up the river to Knappton, following that channel, which way would they go?

A. Oh, they would go right in across them rocks marked "Point Ellice."

Q. That would be away to the north of Desdemona sands?

A. Oh, yes sir. Right close into them rocks they would have to go. Fourteen or fifteen fathoms of water right in there now.

Q. The rocks to which you refer are at the point marked Point Ellice?

A. Fourteen or fifteen fathoms of water right in to the rocks; always has been, too.

Q. What draught of vessels entered when you first went on the bar, piloting?

415 A. Well, they were small vessels then. In 1875 there were vessels drawing 23 and 24 feet.

Q. In 1867?

A. In 1875.

Q. Well, in 1867 I say.

A. Vessels coming here, I suppose about 16 to 18 feet or 20 feet. They weren't as deep draught as now; they were smaller vessels. About 20 feet some of them drew. There were very few coming then. They were mostly coasters then. They would draw from 16 to 18 feet. Had to sail in then; there were no tug-boats then. Sail in the north channel and sometimes anchor in Baker's Bay.

Cross-examination.

By Mr. MACDONALD:

Q. Are you now actively engaged in piloting?

A. Yes sir.

Q. Across the bar?

A. Yes sir.

Q. How far is Knappton from Point Ellice?

A. I should judge about two miles.

Q. Knappton is on the Washington side, is it not?

A. Yes sir.

Q. Knappton is above Point Ellice?

A. Yes sir.

Q. Nearer to Portland?

A. Yes sir.

Q. There is a large saw-mill at Knappton, is there not?

A. Yes sir.

Q. And they ship large quantities of timber from that point?

A. Yes sir.

Q. And is it not a fact that the vessels that come up and follow this course from Chinook Point to Point Ellice and on to Knappton go there for the purpose of getting this lumber which is being manufactured at that point?

A. Yes sir.

416 Q. And they go no farther than Knappton, do they? They load there and then go right out to sea?

A. They load there, yes sir.

Q. And no vessels which are coming from the open sea take this northerly route up past Chinook Point and past Point Ellice and Knappton and then go north?

A. No sir, but they have done it, because they load vessels there and take them straight on up to Portland. And vessels from Portland come that way too—there used to be years ago.

Q. I will ask you whether or not that was the customary and usual channel up past Chinook Point, past Point Ellice and past Knappton on to Portland?

A. No sir, it was not.
Q. It was only occasional that vessels went that way?
A. Occasional.
Q. And vessels of lighter draught?
A. Yes sir.
Q. Vessels of heavy draught, sea-going vessels and ships, took this southerly channel past Fort Stevens?
A. Past Fort Stevens, yes.
Q. Past Tansy Point and up here in front of Astoria and up the river that way?
A. Yes sir.
Q. And that has been the case ever since you have been on the river?
A. Yes sir, since 1867.
Q. You never had any occasion to take any measurements yourself of the actual depths of these north and south channels, did you?
A. Yes sir.
Q. When did you take measurements of them?
A. All the time; every day, about. Not when I am on the tugboats.

417 Q. Wasn't it a fact that in 1868 or 1870 the south channel was deeper than the North channel?
A. No sir.

Q. Isn't it a fact that the South channel in 1868 had a depth of 27 feet, while the North channel only had from 21 to 22 feet?
A. I don't think so, sir.
Q. You wouldn't be positive about that, would you?
A. I know we always used to use that, go where the deepest water was if they had a deep-draught vessel.
Q. But you are not positive as to the relative depth of those two channels at that time?
A. Not exactly, but they always used it.
Q. Now, as I understood you to say, you had no tug boats in those early days when you went on the river?
A. No sir.
Q. And that sailing vessels came in?
A. Yes.
Q. Isn't it a fact that it was easier for a sailing vessel to come into the North channel on account of the protection that would be afforded to it by Cape Disappointment and that high headland there?
A. No sir.
Q. Wasn't that one reason why sailing vessels came in?
A. No sir. They would come the South channel.
Q. Didn't it depend largely upon the direction of the wind as to which channel you came in?
A. A good deal to it, yes sir.
Q. And if the wind was from the northwest you would come in on the North channel?
A. No sir.
Q. You would come in on the south channel?

A. You would come in with a northwest wind just as well,
418 if you came over the sand, as you could with the north channel.

Q. If the wind was from the northeast, which channel would you come in?

A. Wouldn't come in at all.

Mr. MACDONALD: Wouldn't come in at all? Pilots don't seem to agree on this. I don't know what a landsman is going to do when pilots don't agree.

Q. You are familiar with the location of Sand Island as it was when you first came on the river here?

A. Yes sir.

Q. Sand Island has moved a very considerable distance to the north, has it not?

A. Yes sir.

Q. About how much would you say?

A. I couldn't say. We go with these ships now about where Sand Island used to be. Where we tow deep draught ships Sand Island used to be.

Q. Sand Island has moved about three miles north in the last 40 years?

A. I should judge very nigh that. It is a small island now, but then it was the whole country.

Q. Where the old, original Sand Island was 40 or 50 years ago, when you first came on the river, is entirely under water now, isn't it?

A. Yes sir, where Sand Island used to be when I first came here you can tow ships over there now.

Q. I understood you to testify that in those early days, when you first came on the river, you were able to bring in your vessels through a channel north of Sand Island?

A. Yes sir.

Q. And it isn't possible to do that now, is it?

419 A. No, you can't come there with a tug boat.

Q. It is a fact that in low water the depth does not exceed three or four feet in the channel north of Sand Island at the present time?

A. I should judge not. I have not been down there for some time. I guess you can walk across there now in low water.

Q. It is a fact that that channel is not used at all by deep sea-going vessels at any time?

A. No.

Q. I wish you would indicate on this map, Oregon's Exhibit No. 4, the course which you took in the first years when you came on the river, with your vessels from the Cape up the river.

A. If you got a parallel scale I can lay the course right down pretty nigh. How old is this chart?

MR. MACDONALD: This chart was made in 1851. Kindly indicate on this map the course that you took when you first came on the river.

A. (After using rule.) That is about where we used to steer up.

Q. Just give your directions so that the record will be intelligible.

A. If you have got a parallel scale so I can work it up I could tell you the course we used to take. There is the course, but if I had a parallel scale I could tell you the exact course.

Q. Tell in a general way how you came in there.

A. You just come right in here, right around here.

Q. When you say "come in here," say where. When you came in from the ocean you came in close to Cape Disappointment?

A. Close to Cape Disappointment, yes sir.

Q. Then you took an almost due easterly course?

420 A. Yes sir.

Q. Past this Sand Island as shown on Oregon's Exhibit No. 4?

A. Yes sir.

Q. Then you went southeast close to Fort Stevens?

A. Yes sir.

Q. Then you passed along to Tansy Point?

A. To Tansy Point.

Q. And then up to Astoria?

A. Then up to Astoria, yes sir.

Q. Now, you came within 400 or 500 yards of Fort Stevens, did you not?

A. Yes sir.

Q. And within a few hundred feet of Tansy Point as shown on this map Oregon's Exhibit No. 4?

A. Yes sir.

Q. And then you followed along the Oregon shore until you reached Astoria?

A. Yes sir.

Q. And when you got to Astoria you were only two or three hundred feet from the land here, were you not?

A. Four or five hundred feet.

Q. I will call your attention to this Sand Island here which is marked "Sand Island Beacon," on Oregon's Exhibit No. 4, and ask you to state as nearly as you can how close you came to the east end of that Sand Island in passing up the river?

A. Well, we used to go within probably 50 to 100 feet.

Q. 50 to 100 feet?

A. 100 feet. It was very deep water right off there.

Q. And then you passed right down close to Fort Stevens and up the river, as you have just indicated?

A. Yes sir. The sand would change a good deal. One

421 time we had to go within about 100 feet of Sand Island, the head of it there.

Q. I wish you would indicate on this map as nearly as you can the present course that is used by ocean-going vessels and steamers in coming up to Portland and Astoria.

A. Now?

Q. Yes sir.

A. From the sea to Astoria?

Q. From the sea to Astoria.
A. Well on this chart——
Q. Let me take another chart. This is an old one. We will refer to Oregon's Exhibit No. 6, and I will ask you to indicate upon this chart the present course which is pursued by ocean-going ships and steamers of the deepest draught.
A. The way they do now?
Q. Yes sir.
A. When was this chart made?
Q. This is the very last one made in 1905. We will take a vessel coming from the south, from San Francisco. This line here indicates, as I understand it, the Jetty. (Pointing on map.)
A. The Jetty, yes sir.
Q. Now, how far due west from the end of the Jetty would your course be in coming into the river?
A. Right here is where we come now-a-days with deep draught ships, right in from here and down through here.
Q. That is right close to whistling buoy C?
A. Yes sir.
Q. As shown on Oregon's Exhibit No. 6?
A. Yes.
Q. Then, as I understand you, you passed up to the north
422 of mid-channel buoy; close by these mid-channel buoys?
A. Yes sir, away up around here.
Q. Between them?
A. Yes sir, as a rule we do, coming in. That is the deepest water, right up along here.
Q. You pass close to the first, second and third bar buoys?
A. Yes sir.
Q. And north of this No. 4 buoy; is that it?
A. Yes sir; this is the way we generally come in.
Q. Then you passed north of No. 4, No. 6, No. 8, and No. 10 buoys a half a mile or so?
A. Yes sir.
Q. And then continue up the river between No. 12 and No. 3 buoys?
A. Yes sir.
Q. Opposite Fort Stevens, and then you continue straight up the river between the buoys shown on this map until you get into Astoria?
A. Yes sir.
Q. How long has that channel been used by ocean-going vessels and steamers?
A. I couldn't say exactly; it changed a good deal. I couldn't state just how long. I don't know how long. Some time. It has been changing so much I don't remember.

Mr. MACDONALD: I will ask to have sheet 6140 marked "Washington's Exhibit A for identification."
The same was so marked.

Q. This channel after it passes Knappton becomes what is known as a blind channel, doesn't it?

A. I think it does; something of that kind.

Q. So that it is possible for vessels to go only a short distance above Knappton?

423 A. I have seen them bring them right down to Portland over that way to load lumber, and I have seen them bring them up that way.

Q. How long ago?

A. I should say about 20 or 25 years ago.

Q. Do you know whether or not that channel above Knappton has been used in recent years for heavy-draught vessels?

A. No sir; it has not, never was used for deep-draught ships.

Q. It is too light to be used for such purpose?

A. I don't know about how much water there is; I never was up there.

Q. It becomes a blind channel a little beyond that.

A. When they would bring ships down from Knappton to load I have seen them bring them down that way several times.

Q. I hand you Washington's Exhibit A for identification. I will ask you to examine this black line delineated upon this map and marked "1905 channel line" and I desire to inquire of you whether or not that does not show the course now followed by the deep-sea vessels and steamers in going up to Astoria and Portland? Just examine it carefully.

A. Yes sir, that is it.

Q. And that line is correct so far as it shows on this sheet?

A. Yes sir; that is right.

Q. I will call your attention to this blue line indicated on Washington's Exhibit A for identification, which passes, as you will observe, north of Sand Island, and I will inquire of you whether at this time ocean-going vessels use or pass over the water indicated by that line?

A. Not now, no sir.

Q. Have they within recent years?

A. No sir.

Q. Did you ever know of any ocean-going steamers or ves-

424 sels taking a course which would be shown by this blue line marked "Boundary Line claimed by Oregon" in passing from the sea to Portland, as far as Sand Island?

A. Yes sir, but not across this way.

Q. How long is it since ocean-going vessels used the course as shown by this blue line as far or beyond Sand Island?

A. Well, there has been no very deep-draught ship come in there, I think, since 1882; but in 1886 or 1887 light-draught vessels went that way—16 to 18 feet.

Q. But within the last ten or fifteen years no vessels at all have used the course as shown by the blue line?

A. No sir, not at all.

Q. And it is not possible at the present time for any ocean-going vessel or steamer to follow the course shown by the blue line?

A. No sir, you couldn't use it. You can walk there now. You can walk across there now in low water.

Q. And no vessels have used this course as shown by the blue line within the last 20 years, have they?

A. Not within the last 20 years, no sir. No vessels of any draught at all.

Q. Did vessels at any time, when using the channel north of Sand Island, come as far to the north as shown by this loop of the blue line in Baker's Bay?

A. They used to anchor them around in there, all around.

Q. I know, but did you ever use a course as far north as shown by this loop in Baker's Bay, in going up the river to Astoria or Portland?

A. Well, we didn't ever used to take them over as far as that.

Q. As far north?

A. We used to take them in around there. (Pointing on map.)

425 Q. It is a fact that at the end of this straight line which terminates just south of Cape Disappointment that you took a course easterly towards Sand Island, as shown, out in the middle of the river?

A. Yes sir.

Q. And southeast to Fort Stevens and up the river, as you testified a few moments ago?

A. Yes sir.

Q. I understand you to say that you are a bar pilot and not a river pilot?

A. A Bar pilot. I don't know anything about the river. When you get up above Knappton and Tongue Point I don't know anything about it. In early years I have towed vessels up that far.

Q. How far did you take them up?

A. As far as Portland.

Q. When did you do that?

A. Several times; I think about 1885, along there. I don't remember the circumstance, but boats once in a while would tow up. Once in a while I would take a tug boat and tow up a coaster.

Q. Were those vessels of pretty deep draft?

A. No sir, of light draft.

Q. How much water would they draw?

A. Draw probably nine or ten feet of water—not as much as a tug boat.

Q. You towed no ocean-going vessels up, did you?

A. No.

Senator FULTON: They were ocean-going vessels, weren't they?

WITNESS: Yes sir, ocean-going vessels.

Q. In going up from Tongue Point, towing these coasters that you have just mentioned, did you go through Woody Island channel?

426 A. I don't know nothing about it, sir; when I get up above that point I don't know anything about it.

Q. Can you indicate from this map the point you took?

A. No sir, I couldn't.

Senator FULTON: I understand they always have a pilot on the river boats.

WITNESS: Yes.

Q. You didn't do the piloting?

A. No sir.

Senator FULTON: He is captain of the tug boat.

By Senator FULTON:

Q. Now, Captain Staples, the reason you would bring the vessels up this way, up this course that you have indicated to Astoria, was primarily because all vessels that come in from the ocean, or practically all, come to Astoria in the first instance, do they not?

A. Yes sir.

Q. Had there been a port on the opposite side from Astoria, could not all vessels, covering the time you have testified, have gone to that port with equal facility, as far as water is concerned?

A. Yes, better; there would have been more water.

Q. To a point opposite Astoria?

A. Yes sir. They would have had more water. There is more water off Point Ellice than there is anywhere else. There are 15 fathoms of water off Point Ellice.

Q. And a good deep channel from the entrance of the river right up to that point?

A. Yes sir.

Q. During all the time that you have testified?

A. Yes sir, plenty of it.

427 Q. Now, the channel above Astoria which the ships follow at the present time and did follow during the period to which your testimony relates, has been kept open very largely by dredging, has it not?

A. Altogether, yes sir.

Q. Could not the shoal places that occur in what is known as the north channel following up the Washington shore have been kept open and thereby furnish equally as good a channel, by dredging?

A. Yes sir, I should think it could.

Q. And does not the use of the channel by steam boats and steam vessels tend to churn up the sand and keep the channel open?

A. Yes sir.

Q. A channel that is not used is more liable to shoal than one that is constantly in use?

A. Yes sir. The steamers stir it up.

By Mr. MACDONALD:

Q. Is it necessary for all steamers and vessels passing on to Portland to stop at Astoria?

A. Yes sir.

Q. Why?

A. Because it is the customs house.

Q. Is that true of all steamers and vessels coming, say, from San Francisco?

A. Yes sir.

Q. Everything has to stop at Astoria?
A. Everything has to stop at Astoria, yes sir, because it is the customs house.
Q. How was it with these vessels you speak of, that went up to Knappton and then on to Portland?
428 A. They came from Knappton to Astoria.
Q. And got their clearance papers there?
A. Yes sir.
Q. Is it necessary for steamers which leave Portland destined for San Francisco to stop at Astoria?
A. Yes sir.
Q. Why?
A. On account of the customs house.
Q. Is there not a customs house at Portland?
A. But they have to stop here just the same.
Q. Do they get a clearance at Portland and also one at Astoria?
A. Yes sir; in and out.
Q. In and out?
A. Yes sir.
Q. Is the north channel passing Chinook Point, Point Ellice, Knappton and continuing on up on the north bank of the river as good a channel as the one South past Astoria?
A. It is better water than it is up this way.
Q. Up to Knappton you think it is better?
A. Yes sir.
Q. How is it from Knappton on, following the line of the Washington shore?
A. I couldn't say about that.
Q. You don't know about that?
A. Above that I don't know what there is.
Q. This blind channel we spoke about a few moments ago is just a little bit above Knappton, isn't it?
A. Yes, it is about Knappton. When you get up above Knappton I don't know anything about it in particular.
Q. Is it possible for vessels—and I speak of vessels of deep
429 draught—to go from Astoria to Knappton in a direct line?
A. No sir.
Q. What direction would a deep sea-going steamer take in going from Astoria to Knappton?
A. Have to go around Desdemona Sands here.
Q. West of Desdemona?
A. Yes sir, and come right across.
Q. That is, have to go from Astoria westward to Fort Stevens, and then north along the Washington shore and up to Knappton?
A. Yes sir.
Q. What is the number of miles from Astoria to Fort Stevens?
A. About six miles, I should think.
Q. I will ask you whether or not you have ever known of ocean-going steamers bound for Portland first coming to Astoria and then coming back to Fort Stevens and taking the Northerly channel up by Knappton on to Portland?
A. No sir.

Q. You have never heard of a vessel doing that?
A. No sir.
Q. The uniform course in all these years has been for deep sea-going vessels to go on up to Astoria and continue on up the southerly channel?
A. Yes sir.
Q. And that is the uniform rule at the present time?
A. Yes sir.

By Senator FULTON:

Q. That is because the vessels in the first place go to Astoria, isn't it, more particularly than anything else?
A. Yes.

By Mr. MACDONALD:

Q. If this north channel were the better channel it would
430 be possible for the customs house officials to come over to Knappton or Point Ellice and make clearance there, would it not?
A. What did you say?
Q. I say if this north channel were the better channel and it were desired by the sea-going vessels to use it, it would be possible for the customs house officials to send over the necessary papers from Astoria to Knappton and let them clear there?
A. Yes sir.
Q. They could do that just as well as not, couldn't they?
A. I don't know anything about the customs house work at all. I don't know whether they could or not. That is more than I know.
Q. Well, why do you say that the deep sea-going vessels use this southerly channel because they have to go to Astoria?
A. Because that is the way they have to go to Portland.
Q. Don't they use this channel because it is the best channel?
A. It is not the best channel up to Knappton; there is more water there.
Q. Taking it as the entire channel and the entire course, isn't this channel the better channel?
A. That I don't know, whether it is or not.
Q. If you were taking a deep sea-going vessel up to Portland, and it was not necessary for you to stop at Astoria, you would still take the southerly channel, would you not?
A. I shouldn't take it from Astoria to Portland. I don't know the way. I would have a pilot.
Q. Which way, then, would a vessel go?
A. I don't know. I leave it to the pilot.
Q. You don't know which way they would go?
A. No sir, I don't know.
431 Q. So you don't pretend to know anything about the channel above Astoria?
A. No sir. I don't want to know it.

Senator FULTON: It is outside of your bailiwick.

432 Capt. A. C. FISHER being duly sworn as a witness on behalf of the defendant, testified as follows:

Direct examination.

By Senator FULTON:

Q. Capt. Fisher, state your age and occupation.
A. Sixty years old; I am a merchant.
Q. Anything else besides a merchant?
A. I used to captain on the river.
Q. That is the important part as far as this inquiry goes. You have, then, been engaged in the occupation of captain or master of vessels, navigating the waters of the Columbia River?
A. Yes sir.
Q. How long were you so engaged?
A. From 1865.
Q. Up to what time?
A. Up to 1891.
Q. What portion of the river were you navigating during that period with your vessels?
A. All the way from Oak Point or Portland to Cape Disappointment on a sailing craft, carrying guns and cannon balls and lumber, etc.
Q. All the way from Cape Disappointment, you would say, to Oak Point?
A. To Oak Point, yes sir.
Q. How far is Oak Point up the river above Astoria?
A. I think it is 40 miles.
Q. I invite your attention to Oregon's Exhibit No. 7, and ask you to describe where the steam boat channels and channels for
433 vessels—what I may call channels of commerce—are in the Columbia River, as indicated on that plat.
A. That time—in 1865?
Q. 1865, and from that time on up.
A. In 1865 the ships' channel came around Cape Disappointment, as Captain Staples described.
Q. Speaking of Cape Disappointment, I call your attention to Oregon's Exhibit No. 6, No. 7 being a continuance or a continuation.
A. Yes.
Q. Now proceed.
A. Well, come in the north channel around Sand Island at that time.
Q. To the north of Sand Island?
A. North of Sand Island. Sand Island was then away south, or the channel was away south of where that island is now, at that time.
Q. The island, then, has grown towards the Washington shore?
A. Has grown north, yes.
Q. Now, how was the water up, we will say, to Point Ellice? How was it as to there being a good ship channel?

A. There was plenty of water there for any of the vessels crossing the bar up to Point Ellice.

Q. From Point Ellice on up the river, how was the channel and how is it now?

A. Up to Knappton was plenty of water; from there up it was good water—up to, I guess, about two miles, and then it shoaled up to about, I guess, twelve or fourteen feet in low tide—a little narrow place.

Q. How wide was that shoal?

A. Oh, that might have been half a mile, as near as I can remember.

434 Q. Crossing that, what would you come into?

A. There would be plenty of water again up to Harrington Point.

Q. And then you get into the main channel of the river?

A. Yes.

Q. And plenty of water from there on up?

A. Yes sir.

Q. Then, the only obstruction to that north channel was this shoal where there would be 12 or 14 feet of water at low tide, and which was probably a quarter of a mile wide ?

A. It might have been half a mile wide.

Q. Now that is the north channel?

A. Yes, the north channel.

Q. Now take the south channel. Or was there a south channel also?

A. The south channel is the channel coming by Astoria, and then there was a middle channel.

Q. Describe the middle channel.

A. The middle channel would come up north of Desdemona Sands and come out by Tongue Point. There was a shoal place in that a little below Astoria.

Q. About where did the middle channel start? If a vessel were going to follow the middle channel where would it enter it coming from the sea?

A. The way it run then, it would go up from Cape Disappointment southeast towards Astoria.

Q. Going north of the Desdemona Sands?

A. Going North of Desdemona Sands.

Q. There was a shoal in that, you say?

A. Yes sir.

Q. Up near Tongue Point?

A. No, abreast of Astoria.

435 Q. How wide was that shoal and how much water was there on it?

A. I guess a mile or a mile and a half long. There was about ten feet of water, as I remember, at low tide.

Q. What is the rise of the tide?

A. It is six feet on the average.

Q. Then getting over that shoal place, that middle channel would lead in to what?

A. The main channel above Tongue Point. Get 100 feet of water about Tongue Point.

Q. Now take the south channel. You say it is the channel that came in along by Astoria from the sea?

A. Yes sir.

Q. How was it in 1865, along there, as to the depth of water in it?

A. There was plenty of water until you got up to Tongue Point; and then it has changed there several times since then.

Q. But I am speaking of about how it was then.

A. It was shoal up above or what is called the Hog's Back.

Q. What was the depth of water at low water?

A. I don't remember, but a sailing vessel at that time, that class of vessel that came, drawing about 18 feet, would have to wait for high water to come across the Hog's Back.

Q. How was that Hog's Back and shoal place removed?

A. They have built a Jetty since and have been dredging.

Q. I will call your attention to Oregon's Exhibit No. 7, and ask you to indicate about where the Hog's Back was with reference to Tongue Point.

A. The Hog's Back was right in here. (Pointing.)

Q. About at the place marked with the word "Woody" followed by "Island Channel" just off the little island below Snag Island, as marked on the map?

436 A. Yes sir. In those times a ship channel was on the south side of Snag Island, and a few years afterwards it changed on the north side of Snag Island—around this way. (Pointing on map.)

Q. Then, the ships do not go up by way of the Woody Island channel at the present time, do they?

A. No sir, they go right over towards Harrington's Point now.

Q. They sail from Tongue Point across to Harrington Point and what is marked on this map as Yellow Bluffs?

A. Yes sir.

Q. Now, you say that the shoal place, called the Hog's Back, has been removed by the construction of the Jetty and by dredging?

A. Yes sir.

Q. Is that Jetty indicated on the map?

A. No.

Q. I call your attention to the Jetty running across Snag Island. Doesn't that line indicate a Jetty?

A. I think it does.

Q. How has this channel been secured across from Tongue Point to Yellow Bluffs?

A. It cut through itself first, and then I think they have been dredging it some since.

Q. Cut through after the construction of this Jetty?

A. I think it has, yes sir.

Q. Has it not been made navigable by dredging?

A. Yes sir, I think it has.

Q. There was an indication of an increased depth there?

A. Yes sir, they dredge in here off of Tongue Point every year.

Q. There was an indication of the deepening of the water there after the construction of this Jetty, but in order to make it navigable they had to dredge it, didn't they?

A. Yes sir.

437 Q. Now compare the north channel with the south channel; assuming the narrow shoal place to which you have refefred as carrying 12 or 14 feet of water at low tide, to be removed by dredging, which would be the better, deeper channel—the north or the south channel?

A. I think the north channel would be the safer, straighter.

Q. And generally deeper?

A. Yes sir, deep water up to Knappton.

Q. Hasn't the channel leading down to Astoria been kept open because Astoria was the chief commercial city on the lower Columbia?

A. Yes sir.

Cross-examination.

By Mr. MACDONALD:

Q. Are you actively engaged in piloting at the present time?

A. No sir. I never was a pilot. Well, I was a pilot in one way; I owned my own vessel.

Q. How much water did your vessel draw?

A. Oh, I was running one of these little river boats drawing six or seven feet, that is all.

Q. Did you ever operate or pilot an ocean-going steamer across the bar?

A. No sir.

Q. Or up the river?

A. No sir.

Q. Or did you ever command or pilot a boat drawing more water than the one you have just spoken of as being owned by yourself?

A. No sir.

Q. So that your experience upon the river, so far as actual work is concerned is limited to a vessel of the character you have

438 just described drawing a few feet of water?

A. I was running what they call a sailing scow for ten years before there were any steamboats here and it had a center board running down 20 feet, and when we drove from one side to the other we could tell how deep the water was.

Q. Now, you said the north channel would be the better channel? Why?

A. It would be straighter and nearer.

Q. Nearer to where?

A. To Portland, on the way to Portland.

Q. And straighter?

A. Yes sir.

Q. And what other advantages would it have?

A. Well, I don't know of any.

Q. Isn't it a fact that up the river from Knappton the channel becomes what is known as blind?

A. Well, there is no channel there; that is, an open channel. The blind channel is the one in the middle.

Q. Isn't it a fact that there is an open channel right close to the Washington shore above Knappton?

A. There is an open channel. It is not as deep, as I state; it shoals up, but it is a channel right through.

Q. Is it possible for an ocean-going vessel to go to Portland by taking the north channel along the Washington bank?

A. Yes sir.

Q. At the present time?

A. Yes sir; light draught vessels.

Q. I mean deep-draught, ocean-going steamers?

A. No sir, they couldn't without dredging. By dredging they could do it.

Q. But not without dredging.

439 A. No sir.

Q. I will ask you if the deep sea-going vessels have used the north channel in the last two or three years in going to Portland?

A. No sir, I don't think they have.

Q. And it is not possible, on account of the shoal water, to do so?

A. No sir.

Q. The channel that has always been used for the last fifteen or twenty years is this southerly channel that passes close to Astoria and on to Tongue Point?

A. Yes sir.

Q. And that is the channel that is now being used?

A. Yes sir.

Q. Are you familiar with the mode of conducting business with customs houses?

A. Not very much. I know every vessel that comes here from the outside has to enter the customs house going *it*, be that vessel large or small.

Q. Suppose a vessel could use the north channel and went over here and entered at Knappton; the master of that vessel could take his papers over to the customs house and get his clearance, without taking his boat to the customs house, couldn't he?

A. He could do it, but he would lose three or four hours' time.

Q. You say this northerly channel is shorter than the southerly one. Would he not, therefore save time?

A. No sir. He could run a steam boat twenty miles while he was pulling a row boat three miles.

Q. He could, however, come over to Astoria and make his

440 clearance without taking his steamer there?

A. Yes sir, he could.

Q. Now I want to call your attention to Oregon's Exhibit No. 7. When did you first go on the river up on this point, above Tongue Point?

A. Over on that side?

Q. When did you begin navigating the river?

A. In 1865.

Q. I will ask you whether or not it is not a fact that in 1865 the channel ordinarily and customarily used by vessels in going to Portland came close to Tongue Point, then came up the Woody Island channel——

A. Yes sir.

Q. And then through the Cordell channel?

A. No, it went south of the Woody Island channel for a number of years after I came here—Snag Island.

Q. It came up this Woody Island channel as marked on this Oregon Exhibit No. 7, and continued through the Woody Island channel just south of Snag Island?

A. Yes sir.

Q. And came up on the channel appearing on this map to Three Tree Point?

A. Yes sir.

Q. And then from there on?

A. Yes sir.

Q. You say that was the channel used in 1867?

A. Yes sir, exclusively.

Q. Do you know what channel was used in the years just preceding that?

A. I don't know, but I think it was the same channel as far as I have heard.

Q. It is a fact that was the channel that was used for a
441 good many years previous to that?

A. I think it was.

Q. After the time that you have just testified to, the channel was changed, was it not, so that you passed north of Snag Island, through what is marked on this map as Cordell channel?

A. Yes sir.

Q. And how long did you continue to use Cordell channel?

A. Oh, it was quite a number of years; I don't remember just how many years, it must have been eight or ten years, as far as I remember.

Q. And then did you go back to Woody Island channel after that?

A. No sir. And then the channel cut through here.

Q. Then the Government began its dredging operations from Tongue Point over to the Yellow Bluffs?

A. Yes sir.

Q. And after the dredging of that channel the vessels then began to use this channel from Tongue Point to Yellow Bluffs?

A. Yes sir.

Q. Which is the channel which is being used at the present time?

A. Yes sir.

Q. Had it not been for the dredging operations of the Government, however, they would still be using the old Woody Island channel would they not?

A. I don't believe they would have gotten any vessel to Portland if they had.

Q. If they had done their dredging through the Woody Island channel they could have maintained that channel, could they not?

A. Well, they might.

Q. This channel from Tongue Point to Yellow Bluffs would not have been available unless it had been dredged?

442 A. No sir. It was a shallow place right in the middle where they dredged, called Miller's and Taylor's sands—right off here. (Pointing.)

Q. Do you know whether or not the Government is now dredging or has been dredging there in recent years?

A. I don't remember whether it dredged last year or not.

Q. But it did for several years, until quite recently?

A. Yes sir.

Q. You are quite positive that had it not been for the dredging of this channel, the channel in its natural state could not have been used as the ship channel going up to Portland? You are quite sure of that, are you?

A. Yes sir.

Q. You are also sure that with a little dredging this Woody Island channel could continue to have been used?

A. I don't think this channel would have blocked up if it hadn't been for the Jetty there.

Q. It is your opinion that if this Jetty had not been constructed this channel would have continued to be available as a ship channel?

A. Yes sir, I do.

Q. And you understand this Jetty was constructed there by the Federal Government?

A. I supposed it was. They tried to throw the current all over here, to go down the north channel.

Q. Do I understand you to say that this Jetty was constructed for the purpose of endeavoring to deflect the current or channel to the north bank of the river.

A. Yes sir.

Q. And had it not been for the construction *on* that Jetty the current or channel would have followed its accustomed course

443 through Woody Island channel down to Tongue Point, as it formerly had?

A. I think it would, yes sir.

Q. Was it possible for you to have used this north ship channel and then crossed over to Woody Island channel above Tongue Point?

A. From Knappton?

Q. Yes.

A. No, not without coming away down toward Point Ellice.

Q. It was not possible, then, in the use of the north ship channel to come beyond Knappton and then cross over and join the river main channel through Woody Island channel?

A. Could not going down toward Point Ellice.

Q. You could only do that by retracing your course down the river and then up again?

A. Yes, you would have to do that.

Q. So that channel would not have been a practicable one for the ocean-going vessels to use?
A. No sir.
Q. And it never has been used?
A. No sir.

Redirect examination.

By Senator FULTON:

Q. In these questions that were asked you just now by counsel for the State of Washington, he asked you and you understood him to be talking about crossing with a vessel from Knappton over to the South channel, did you?
A. Yes sir.
Q. He referred in his language to crossing over to the main channel, but he indicated to you what you call the south channel, did he not?
A. I think so, yes sir.
444 Q. Now, is that any more the main ship channel than the north channel?
A. Not at all, no sir.
Q. If you are following the north ship channel, no one would ever propose to cross as he indicated, would they?
A. It is all dry land between here and there. (Pointing.)
Q. That is, at low tide?
A. Yes. At high tide.
Q. Now, in following the north ship channel you follow along the Washington shore, do you?
A. Yes.
Q. And along the route indicated by you heretofore?
A. Yes.
Q. The only obstruction is a place where it is shoaled up?
A. Yes sir.
Q. Where there is only 12 or 14 feet of water at low tide?
A. Yes sir.
Q. And otherwise it is a good ship channel?
A. Yes sir; right deep water up in here.
Q. And just as deep as the south channel, and straighter?
A. Yes sir.
Q. Now, has there not been more dredging to keep this south channel (which counsel for the State of Washington refers to as the main ship channel) open than would be required to dredge that shoal?
A. A great deal. Where the government has been dredging it is cross current, and filled in as fast as they dug it out. Here is a straight current. It would scour itself out.
Q. Now, this Woody Island channel is really a middle channel, is it not? There is a south or Prairie Channel?
A. Yes.
445 Q. Which ultimately connects with the main ship channel, does it not?
A. Yes sir.

Q. And there is a north ship channel?
A. Yes sir.
Q. And there is this middle or Woody Island channel?
A. Yes sir.
Q. Now, you say there was in 1865 a middle channel that opened up away below Desdemona Sands?
A. Yes sir.
Q. And away to the north?
A. Yes sir. And it is still there.
Q. That connected with this Woody Island channel?
A. With what channel?
Q. It would come in and connect with the Woody Island Channel?
A. Yes sir.
Q. Well now, as a matter of fact, ships could sail from Knappton across to Tongue Point, if they were not of too heavy draught could they not?
A. Yes sir, by going down a little below Knappton, just about a mile I guess; they could cross.
Q. And it would be no great problem to keep a channel open there, would it?
A. I guess not.
Q. It is all sand bottom through there, isn't it?
A. Yes.
Q. That shoal place you mentioned over here in the north channel is all sand, isn't it?
A. Yes sir, sand.

By Mr. CRAWFORD:

Q. You may state whether the channel from Yellow Bluffs
446 across towards Tongue Point was washing out and deepening, from the natural course of the water, prior to any dredging being done there by the government or other parties?
A. I don't know about that. After they built the jetty it opened it out, whether it did before or not.
Q. Prior to the dredging?
A. There was a little channel there, yes sir.

By Mr. MACDONALD:

Q. Referring to Portuguese Point, as marked on Oregon's Exhibit No. 7, I wish you would tell me where the shoal is in this north channel you speak of.
A. It is about two miles, I guess, below the Point.
Q. Two miles west?
A. West, yes sir.
Q. You spoke of another shoal in that channel, did you not?
A. No, not in that one; that is the only one.
Q. Now, you have never known of any deep sea steamers or vessels coming up this north channel in the last few years?
A. I have known several coast steamers to go up through there.
Q. How recently?

A. Oh, it has been, I guess, eight years.
Q. I mean within the last year.
A. No sir.
Q. This shoal up near Portuguese Point is becoming more of a shoal all the time, is it not?
A. I don't think so. Captain Jordan can tell you all about that. He is one of the witnesses here. I have not been there for 14 years. I am just talking about what it used to be in 1865.
Q. You don't know what the present situation is, then?
A. No sir, not at the present time.

447 Q. You spoke of vessels going across from Knappton to Tongue Point. What draught would they be?
A. Not over ten or twelve feet, I don't think.
Q. An ocean-going vessel couldn't do that without going away to the west and coming up?
A. Not a steamer, no sir.
Q. Senator Fulton made some reference to other channels down here south of Woody Island channel, and I think he spoke of Prairie Channel. Was that ever used as a ship channel?
A. No sir, only for river boats.
Q. Just small river boats?
A. Yes sir.
Q. That never was used as the main channel of the river?
A. No sir. It is crooked.
Q. Shoals in places, are there not?
A. Yes sir.

448 Capt. P. JORDAN being duly sworn as a witness on behalf of the defendant, testified as follows:

Direct examination.

By Senator FULTON:

Q. Captain, what is your age and occupation?
A. My age is 48 years, and I am master of steamers under one hundred tons.
Q. Where have you plied your occupation as master of steamers?
A. Between Cape Disappointment and Portland.
Q. On the Columbia River?
A. Yes sir.
Q. How long?
A. From 1885 up to the present time.
Q. You are still engaged in that work?
A. Yes sir.
Q. What portion of the river has your employment called you to traverse?
A. Well, everywhere between Cape Disappointment and Portland.
Q. How many channels are there in the river—what might be called channels for vessels, steam boats, etc.?
A. I would say there are two distinct channels—the north and the south.

Q. Is there a middle channel also?
A. Yes sir.
Q. But the north and south channels are the principal channels?
A. Yes sir.
Q. Where is the north channel, speaking of points on the river between Cape Disappointment, we will say, and Oak Point?
Senator FULTON: How much is in controversy here?
449 Mr. MACDONALD: Up to Three Tree Point.
Senator FULTON: Then we will confine it to Three Tree Point. Speaking of that section of the river between Cape Disappointment and Three Tree Point, where is the north channel?
A. It follows the north shore from Chinook Point right along up to Harrington Point, and from there right up along the north side of the river—the Washington side of the river.
Q. I ask you to look at the paper I now have in my hands, purporting to be a map of a section of the Columbia River, and I direct your attention to that portion of it from Chinook Point to Three Tree Point. State whether or not the north channel to which you have referred is indicated on this plat, and if so by what.
A. I don't think that north channel is indicated on this map, gentlemen.
Senator FULTON: I will withdraw that map, then.
Q. How near the Washington shore from Chinook Point to Three Tree Point does the north ship channel run?
A. It varies at different points. At Point Ellice it runs in very close; at Cliff Point it runs in very close, and also at Portuguese Point it runs in very close.
Q. And at Yellow Bluffs?
A. At Yellow Bluffs it runs in within a quarter of a mile. And at Gray's Bay, you see yourself in there a big stretch where it does not go within three miles of the shore.
Q. It goes across from Portuguese Point to Yellow Bluffs?
A. Yes.
Q. And then along the Washington shore inside of Pillar Rock?
A. Yes sir.
Q. And by Jim Crow Point?
A. Right close to the Point, yes sir; right from Jim Crow
450 Point in a straight line to Three Tree Point.
Q. Now, how is that channel as to depth of water from Chinook Point to Three Tree Point as compared with the south channel or the channel which goes by Astoria and Tongue Point?
A. From Chinook Point to Knappton there is more water than there is abreast of Astoria, and from Knappton up to Yellow Bluffs it is shoal, and up through Gray's Bay there is about 14 feet at high water at the present time, in the present channel. That is right along in here. (Pointing.)
Q. What distance is that shoal water?
A. It is about a mile now.
Q. About a mile now?
A. Yes sir.

Q. Has it been getting wider—that shoal point?
A. I think it has, yes sir, in the last few years?
Q. And how much water is there in the shoal place?
A. About 14 feet at high water.
Q. At the present time?
A. I suppose that is about 9 feet at low water?
Q. At the present time?
A. Yes sir.
Q. What sort of bottom is it there?
A. Hard sand.
Q. Is it easily dredged?
A. Yes sir.
Q. If that were dredged out, how would the north channel, as a channel of commerce or highway for deep-sea going vessels, compare with the south channel?
A. It would be shorter and straighter.
Q. Would it be equally as good for depth of water?
A. If it was dredged?
451 Q. If that shoal place you speak of was dredged?
A. Yes. There are more shoal places in there than that one.
Q. How about the dredging that would have to be done to keep that open compared with the dredging that is constantly being done to keep the other channel open? Would there be any more required for that?

Mr. MACDONALD: That is objected to as immaterial.

A. Well I don't know as I am a judge of that, gentlemen; whether it would require more or less dredging I couldn't say.
Q. Well, take the south channel. Is the south ship channel of sufficient depth without dredging to accommodate ocean-going vessels above Astoria?
A. It is at the present time, yes sir.
Q. How has that depth been secured? Is it natural, or has it been dredged out?
A. By dredging.
Q. Without dredging could deep sea vessels go through that channel,—that is, had there been no dredging?
A. No sir, they could not.
Q. The obstructions to commerce in that channel would be equal to the obstruction in the north ship channel, do you think, without dredging?
A. I think it would be about a stand-off, yes sir.
Q. But that is the one that has been dredged—the south ship channel?
A. Yes sir.
Q. Is the north ship channel a clear, defined channel?
A. It is with the exception of those shoals that are in it.
Q. How far is Knappton from the sea as compared with Astoria?
A. I guess it is probably a mile or two farther, as far as I know.

452 Q. And up to Knappton how does the depth of water in the north ship channel compare with the depth of water in the south ship channel?

A. It is deeper as far as Knappton.

Q. Now I have asked about the north ship channel and the south ship channel. Is there another channel?

A. There is a middle channel that runs from the lower end of the Desdemona Sands to the ship channel at Tongue Point.

Q. That is a clearly defined channel, is it?

A. Yes sir. There is one shoal place in it to my knowledge.

Q. How shallow is that?

A. There must be sixteen feet of water there at high water, probably eighteen; that is abreast of Astoria.

Q. And ten or twelve at low water?

A. Yes sir, about that.

Q. How wide is the shoal?

A. About a quarter or half a mile.

Q. And the nature of the bottom?

A. Sand.

Q. How long have you known of that middle channel; how long has it been there?

A. I have known of it ever since I have been on the river; since 1885.

Cross-examination.

By Mr. WELSH:

Q. How long have you been engaged in navigation on the Columbia River?

A. About eighteen years.

Q. During that time has the north ship channel that you speak of ever been used for vessels in coming from the ocean and in going to Portland?

A. Coasters have gone through there—coasting vessels, when they went by the way of Knappton.

453 Q. Went up on the north shore?

A. Yes sir.

Q. Do you know what vessels they were?

A. No sir, I couldn't tell you what vessels they were.

Q. Do you know the depth of water at Astoria?

A. Somewheres near, yes sir.

Q. What is it?

A. What part of Astoria? What do you call Astoria? Right in front of town?

Q. Yes.

A. It varies. It varies at high water I presume, from 20 to 25 feet, 30 feet probably.

Q. Isn't it 50 feet?

A. I don't think so.

Q. Will you swear that it is not?

A. No sir, I wouldn't swear to it.

Q. What is the depth of water in front of Knappton?

A. About 20 or 21 feet.

Q. A great deal less than it is in front of Astoria, isn't it?

A. Right in front of Knappton, yes sir.

Q. Now you say that by dredging this north channel could be utilized for deep sea vessels?

A. Yes sir, by dredging.

Q. You say that the south channel could not be utilized were it not for the fact that dredging has been done.

Senator FULTON: Above Astoria, he said.

Mr. WELSH: Above Astoria.

A. I don't think it could for deep sea vessels.

Q. Wasn't it used before there was any dredging done?

A. Yes sir.

Q. Wasn't it the one that was used?

454 A. To my knowledge; as far as my knowledge goes, yes.

Q. Since you have been on the river here, since 1885, wasn't the south channel the one that was used almost exclusively both before and after dredging has been done?

A. I think it was, yes sir, as far as I know.

Q. And it is known as the main ship channel, isn't it, for ocean going vessels?

A. Yes sir.

Q. Has there been any dredging done between Cape Disappointment and Astoria?

A. I really don't know whether there has been or not.

Q. As a matter of fact you know that none has been done, don't you?

Mr. CRAWFORD: He answered the question, he said he didn't know.

Mr. WELSH: He didn't know. He has been here since 1885.

Senator FULTON: I have been here longer than that. I am not positive, but what they did dredge a little down here at the lower end of the harbor.

WITNESS: I think that The Chinook did some dredging, but whether it was dragging with a harrow or what it was, I don't know.

Q. Now all vessels that are going to sea or coming from sea to Portland, Oregon, or to Astoria, use what is known as the south channel?

A. Yes sir.

Q. And during the time that you have been engaged in piloting upon the Columbia River the south channel has so been used?

A. Yes sir.

Q. And it is known as the main ship channel, is it not?

A. Yes sir.

Q. And no one ever thinks of using the north channel that

455 you speak of; it is out of the question, isn't it?

A. Only for small steamers; that is, light draught vessels go through there.

Q. They would have to be very light would they not?

(No answer.)

Q. You know as a matter of fact that at low tide there are places there where the water is not to exceed four feet?

A. I said there was nine feet at low water. Vessels drawing over nine feet could not go through.

Q. Are there any places that the water is of a great deal less depth than that?

A. No sir.

Q. The middle channel that you speak of has not been used in your time?

A. Not for sea-going vessels.

Q. It is practically no channel, isn't that true?

A. No, I couldn't say it is no channel, because it really is a channel.

Q. Well, it isn't used?

A. No it isn't used.

Q. It is not used for sea-going vessels?

A. No.

Q. And it never has been used during all of your experience here on the river?

A. No sir.

Redirect examination.

By Senator FULTON:

Q. There are no ports or towns on the north or Washington side of the Columbia River, are there, within the limits of Three Tree Point and Chinook Point?

A. No sir.

Q. This place called Knappton, what is it?

456 A. It is a little saw mill town.

Q. Simply one saw mill there, isn't there?

A. That is all.

Q. No persons there excepting those employed in and about the mill; that is all, isn't it?

A. That is all; just the employés of the mill.

Q. And the sea port is Astoria on the Oregon side?

A. Yes sir.

Q. That is what brings the vessels here isn't it?

A. Yes sir.

Q. Counsel asked you if, as a matter of fact, vessels did not go to Portland before dredging was done on the river? I ask if it is not a fact that the channel was continually shoaling so bad that they had to resort to dredging in order to get the vessels through?

A. Yes sir, that is right.

Q. And isn't it a fact also that until the last few years up to within 10 or 12 years ago, much lighter draught vessels came into the river than have been coming since?

A. Yes sir, very much so.

Recross examination.

By Mr. WELSH:

Q. On the north side of the river there is a place known as Ilwaco, which is quite a little city, isn't it?
A. Yes sir.
Q. Also a place called Chinook, which is quite a place?
A. Quite a little village, yes sir.
Q. No ocean-going vessels possibly go to Ilwaco?
A. No sir.

By Senator FULTON:

Q. The town of Ilwaco is on what is known as Baker's Bay, is it not?
457 A. Yes sir.
Q. And that Bay is very shallow, is it not?
A. Yes sir, almost dry. You can walk from Sand Island to Chinook at low water.

By Mr. WELSH:

Q. Sand Island is north of the channel that has been used during your time, is it not? Sand Island is now north of the channel that has been used?
A. Yes sir.
Q. Which is now used. And Desdamona Sands are also north of the channel that is so used?
A. It is north of the south channel.

By Mr. MACDONALD:

Q. Captain Jordan, I didn't understand whether you were a bar pilot or a river pilot.
A. I am master of steamers under 100 tons, pilot steamers.
Q. How much does she draw?
A. Seven feet.
Q. Seven feet of water? Is it a passenger boat?
A. Passenger and tow steamer, yes sir.
Q. Have you ever been a bar pilot?
A. No sir.
Q. Or a river pilot?
A. No sir.
Q. Then your experience is limited, is it to working on this steamer you have been speaking about in towing?
A. Yes sir.

By Senator FULTON:

Q. You have been on the river practically every day since you entered upon this work with your vessel?
A. Practically every day.

458 Captain JOHN PICKERNELL, being duly sworn as a witness on behalf of the defendant, testified as follows:

Direct examination.

By Senator FULTON:

Q. Captain, will you state your age and occupation?
A. I am a steamboat man; am about 67 years old.
Q. Where have you been employed as a steamboat man, and in what capacity?
A. Right around here.
Q. Right around Astoria?
A. Generally kept some little boat or other; Captain of it.
Q. On the Columbia River?
A. Right around the mouth of the river here, generally, yes sir.
Q. Hoe long have you been so employed?
A. Oh, it must be 20 years or more with different little boats around.
Q. As captain?
A. Yes.
Q. Did you work on steamboats before you were a captain?
A. No, not much, no.
Q. How did you learn the river in order to take the position as Captain?
A. Boating, sailing, scowing around in every little crook or hole I could get into.
Q. You were working on the river.
A. Yes.
Q. How long have you been working on the river in one capacity or other.
A. I don't know. You might say I have been here on the river and boating—you can't get anywheres unless you go on a
459 boat, you know—well since 1847. I was a little fellow then. Take it from about 1854 around, I was more or less crossing back and forth around here.
Q. And have been acquainted with the river?
A. And have been acquainted with the river.
Q. What section of the river has your employment called you to navigate principally?
A. Oh, well, it is generally around the mouth here, from here to Fort Canby.
Q. From the mouth of the river, we will say how far up?
A. Well, up around Cathlamet.
Q. That would be beyond Three Tree Point?
A. Yes. I have been to Portland, of course, if anything called me that way.
Q. Now I am going to call your attention particularly to that section of the river which is between the mouth of the river and Three Tree Point. What channels are there in that section of the river?
A. What channel do you mean—on the North side?

Q. I say what channels are there? Is there more than one channel, and if so by what names are they known?

A. The north channel and south channel, I suppose, when you come from Fort Columbia and cross over to Fort Stevens, up around here and by the channel to Kalama.

Q. What do you call that channel.

A. That is what you call the south channel.

Q. Where is the north channel?

A. The north channel goes up the north side along by Knappton, along up through there, Grays Bay, Harrington's Point and along up. (Indicating on map.)

Q. How does the north channel compare with the south
460 channel as to being suitable for navigation?

A. Well, it don't compare at all, not now days at all.

Q. What do you say?

A. It don't compare anything now to what the south is.

Q. It don't compare now to what the south channel is?

A. No; not without there is some way that I don't know anything about.

Q. How was it when you first knew it?

A. Oh, well I don't know as it was very much better, but there is such a big change I can't see. I see now there is no water at all where I have seen these vessels going up years ago.

Q. The north channel?

A. Yes.

Q. Years ago the sailing vessels used to go around?

A. Yes. I have been around with my little boat drawing six feet of water and I could hardly get through.

Q. Where is that?

A. Up in Gray's Bay and around there.

Q. It has shoaled at places, then, since you first knew it?

A. Yes.

Q. The south channel above Astoria, did that shoal also?

A. Well, I don't know. They had the dredge go round here of late years.

Q. They have used the dredger to keep it open?

A. Yes. As far as I can see and know anything about it, the whole Columbia River is shoaling up the last ten or fifteen years, getting shoaler every year. They will have to get more dredges or later on it will close up, I think.

Q. From the mouth of the river up to Point Ellice, how is the north channel as compared with the south?

A. Well it is all right that far, I guess.

Q. A good channel?

461 A. Yes.

Q. Deep water?

A. Yes.

Q. Just as deep as the south channel?

A. Oh, yes.

Q. Deeper, isn't it?

A. Well, I don't know whether it is deeper or not. I never sounded through there, but I should judge it is deep enough.

Q. You know there is plenty of water there for ships of all classes?

A. Yes.

Q. Above there is where the shoaling is?

A. Oh, yes. You have got good water until you get near up to Knappton.

Q. Have good water as far as Knappton?

A. Then it is crooked and short places in it?

Q. I understand you to say up as far as Knappton that there is good water and a good channel?

A. Well, it gets kind of crooked when you get up near there.

Q. From there on there are shoal places in it?

A. Yes.

Q. But there is a regular and well-defined channel with shallow places in it; is that it?

A. Yes.

Q. There never has been any dredging done in that channel, has there?

A. No, no dredging that I know of.

Cross-examination.

By Mr. MACDONALD:

Q. Captain, you would not advise sea-going vessels on their way to Portland to take the north channel would you?

462 A. What is that?

Q. You would not advise sea-going steamers on their way to Portland to use this channel that you speak of, would you?

A. No——

Q. What is that? I don't quite understand.

A. How is that?

Q. These sea-going vessels don't use the north channel at all, do they?

A. No, not without they have to go to Knappton, or something like that.

Q. If a steamer was going up to Portland and wanted to call at Knappton, would it go to Knappton and then come down the river and take the south channel up to Portland?

A. Of course they would.

Q. As a matter of fact they can't use that north channel above Knappton?

A. I don't hardly think it.

Q. Didn't you say a little while ago that it was very shallow in spots?

A. In spots, yes.

Q. So that even your vessel couldn't get through there?

A. Yes. That is when the tide is down.

Q. That is what I am speaking of—low water. And it is a fact isn't it, that all these steamers and vessels going up the river use this south channel?

A. They use this south channel.
Q. And have for a number of years?
A. Yes.
Q. How long did you say you had lived in Astoria?
A. Oh, I have been around this mouth here since 1847.

Q. Have you been familiar with the conditions of the river
463 ever since that time?

A. Yes sir, ever since.
Q. Do you remember the old Sand Island out here in the river?
A. Yes.
Q. That Island has entirely disappeared, has it not?
A. Yes, it has gone away.
Q. It has moved north three or four miles, hasn't it?
A. Yes.
Q. Now, I understood you to say a while ago, that conditions were constantly changing out here in the river and that the sands were shifting more or less?
A. Just blowing over. Washing out here and blowing over.
Q. These channels have changed from time to time during the last 40 years, have they not?
A. Oh, yes.
Q. And those changes have been gradual, slow?
A. Yes; getting shoaler all along.
Q. There have been no sudden changes; they have all been gradual and slow?
A. Just gradual changes.
Q. Now, this change of Sand Island three or four miles to the north, this has been going on gradually all these years, has it not?
A. Yes.
Q. And it is not possible now for an ocean-going vessel to use the channel north of Sand Island?
A. No, not now.
Q. And it would be impossible, would it not, for an ocean-going steamer to come from the open sea into Baker's Bay and around Cape Disappointment and north of Sand Island?

Senator FULTON: We do not contend it would be possible at the present time.

464 A. I don't hardly think it, not now.

Q. It is a fact that the channel north of Sand Island does not exceed three or four feet in depth?
A. That channel does not now, no.
Q. It is so shallow there that at low tide a person could wade through it?
A. Yes.

By Senator FULTON:

Q. You spoke about your vessel striking at low tide at some point? You refer to Gray's Bay?
A. Yes. She draws about six feet of water.

Q. You had reference to trips you would be making up Gray's River to Gray's River Landing?
A. No, outside; making up the Columbia.
Q. Making up the Columbia River?
A. Yes.
Q. When you are crossing Gray's Bay?
A. Yes. I have seen vessels around here taking the channel up around. I have taken the channel from there and dragged and dragged where I have seen these vessels going years ago.

(The hearing was adjourned until July 12, 1906, at 11 o'clock A. M.)

465 ASTORIA, OREGON, *July* 12, 1906.

The hearing was resumed pursuant to adjournment.

JOHN H. LEWIS recalled as a witness on behalf of the defendant, testified as follows:

Direct examination.

By Attorney General CRAWFORD:

Q. Mr. Lewis, you may state whether you established the point which is stated to be "one marine league at sea, due west" of the mouth of the ship channel of the Columbia River on the plat contained in the answer and cross-complaint. This is the point to which I refer. (Pointing on map.)
A. I have shown upon the map the point that you have described.
Q. State whether you established that point and placed it on the map contained in the answer.
A. The point as established is shown on this map.

Mr. MACDONALD: Has that been introduced into evidence or marked for identification?
Mr. CRAWFORD: But I refer to the map in the answer.
Mr. MACDONALD: All right.

Q. The question I am asking you now is whether you fixed that point or not, as it is printed on the map?
A. Well it is fixed as shown there.
Q. Well, I say, did you place that on the map and print it?
A. Yes sir.
Q. Now you may explain how you arrived at the exact point.
A. (Referring to map.) The boundary line follows up the coast to a point due west and opposite the middle of the north ship channel of the Columbia River; thence easterly to and up the middle channel of said river, and where it is divided by islands, up
466 the middle of the widest channel thereof, etc. The point which you have mentioned is fixed in the middle of the north ship channel as shown by the contours representing level lines on the bottom of the mouth of the Columbia River, and it is half way between the contours as shown.
Q. Contours of what?

A. The contours representing on this map level lines on the bottom of the river; and the deepest point would be a point in the center or midway between these contours.

Q. You may state how you arrived at the point, that exact spot, as to its position between Point Adams and Cape Disappointment.

A. Upon the map which you have mentioned two channels are shown in the mouth of the Columbia River, one going north of Sand Island——

Q. Explain by reference to Oregon's Exhibit No. 4.

A. The mouth of the Columbia River is somewhere between the points as shown upon this map, Oregon's Exhibit No. 4, as Fort Stevens and Cape Hancock, and between these points two channels are shown. The north channel is shown by the open space between the two lines made up of three dots representing 18 feet in depth of water; the space between these lines is deeper water, shown at different places by the figures representing fathoms, such as 10 1/3; thence easterly and midway between these lines which I have described, passing south of Chinook Point and Point Ellice midway between these lines; and just east of Point Ellice we find a division in the channel is shown upon this map; one of the channels running close to the Washington shore, the other channel running some distance from the Washington shore. Both are apparently of the same depth. The shallowest depth I note on this division, as shown on this map, is 3¾ fathoms, near the east edge of the map.

467 Q. You may explain whether there is any other channel, as shown by Oregon's Exhibit No. 4, between the two channels you have just explained and the south channel.

A. Between the two channels I have just mentioned and the south channel, as it passes near Astoria, there is no other channel shown upon this map which could be identified as a channel.

Q. You may state whether it was possible in 1851, according to this map, to have sailed a vessel of ordinary depth from Point Ellice to Tongue Point in anything like a direct course?

A. As shown by this map, we see a dark spot just south of Point Ellice marked "bare at low water;" then northeasterly we see the depths marked, 2½, 5¾, 4½, until we come to the first line which represents 6 feet in depth or one fathom. Beyond that we find 8, 10½ and 7 respectively, which shows that a ship drawing 10½ feet of water could have crossed between the points you have mentioned.

Q. Now you may state what is the comparative depth of the middle channel to which you have referred and the south channel—stating from the map.

A. The middle channel to which I have referred and the south channel passing near Astoria are both deeper than three fathoms or 18 feet.

Q. You may explain Oregon's Exhibit No. 7, as to when it shows the hydrography to have been made, the soundings, and then as to its connection with Oregon's Exhibit No. 6—up the river.

A. The hydrography or soundings shown upon Oregon's Exhibit No. 7, were made in 1867 and 1868. That upon Oregon's Exhibit

No. 6 as shown by a notation, was made in 1868 and 1869, but the title gives the date published at Washington, D. C. March, 1905. I also note a second notation: "Hydrography of entrance from survey by the Corps of Engineers, U. S. A. November, 1904." The
468 deep channel which passes close to Point Ellice, as shown upon Oregon's Exhibit No. 6, continues almost east to near the edge of this map where a depth of 26 feet is noticed. A similar channel showing a depth of 3¾ fathoms is found on Oregon's Exhibit No. 7, at what appears to be a continuation of this channel. This channel then gradually shoals in places to 12 feet in depth, coming to deeper water a little south of Portuguese Point, where 3¼ fathoms are noticed; thence following the deep or open space, which represents deep water, we find a shoal between this channel and the channel south of Yellow Bluffs. The shallowest water between these two portions of deep water, as shown upon Oregon's Exhibit No. 7,—that is, the deepest water which it would be possible to find between these two deep portions of the river, is found to be 11 feet.

Q. You may state whether there are any later maps than these two prior to the admission of Oregon into the union of states and prior to the establishment of the northern boundary of the state by the Enabling Act?

A. These two maps which you refer to are Oregon's Exhibits No. 6 and No. 7. They were made subsequent to the admission of the state of Oregon into the Union, I believe.

Q. You may state whether they were the earliest maps after the admission of the state into the union.

A. No, they were not. I believe an exhibit has been made showing the river, dated 1870.

Q. Well, 1868 is prior to 1870.

A. The exhibit I have referred to apparently has not been put in but the hydrography upon these maps is but a little later than 1870.

Q. You may state whether the map which I now show you with the statement thereon: "U. S. Coast Survey, Benjamin Pierce,
469 Superintendent, sheet No. 1, 1870," is the chart or map to which you have just referred as being made in 1870.

A. Yes sir, this is the map to which I have referred.

Q. And do I understand you to say that that map is compiled from the last surveys of the mouth of the river prior to 1870 and after the admission of the State into the Union, as a member of the Union?

A. This is a map representing the mouth of the Columbia River which bears the earliest date after the admission of the state that I have seen.

Mr. CRAWFORD: We offer this map in evidence and ask that it be marked Oregon's Exhibit No. 9.

The map was so marked.

Mr. MACDONALD: The State of Washington has no objection to the introduction of this map.

Q. Now you may state whether Oregon's Exhibit No. 4, and

Oregon's Exhibit No. 5, are the latest maps showing the mouth of the Columbia River, the latter showing the mouth of the Columbia and the former showing the mouth and up as far as Tongue Point, made prior to the admission of the State of Oregon as a member of the Union.

A. In a letter addressed to the Superintendent of the U. S. Coast and Geodetic Survey, requesting that the latest maps prior to the admission of the state of Oregon be furnished me, I received these two maps with the information that they were as represented to be—the latest maps before the admission.

Q. You have not explained fully what I asked you when first called to the stand, and that was how you arrived at the point directly opposite the mouth of the north channel of the Columbia River for a starting point of the north boundary, which the description
470 in the Enabling Act says is one marine league at sea. Please state how you arrive at that point?

A. Upon one of the government publications I found a note describing what is taken to be the mouth of the Columbia River.

Mr. MACDONALD: I wish you would identify that publication.

WITNESS: I do not find the note that I remember to have seen, but on Oregon's Exhibit No. 6, I find lines dividing the high seas from the inland waters relating to rules of the road from Cape Disappointment light to Point Adams' old contour. So this is apparently, the mouth of the Columbia River and the beginning of the high seas. (Pointing on map.) Therefore I have taken the latest map prior to the admission of the state of Oregon as being the map which I assumed the commission, or whoever drew up the description of the boundary line to have had before them, and placing a point in the middle of the north ship channel upon this line which I have described between Cape Disappointment and Point Adams, this point being in the middle of the deepest water, as shown by the contour lines, and which is probably the point which you refer to.

Q. Then, the commencement of the north boundary, according to your explanation, is one marine league due west of that point?

A. Yes sir.

Q. If I understand you correctly, then, the point in the mouth of the north channel of the Columbia River is a point in the center of said channel and on a tangent drawn from the most southern point of Cape Disappointment to the most northern point of Point Adams?

A. On a line drawn between these points, yes sir.

Cross-examination.

By Mr. MACDONALD:

Q. What do you understand to be the mouth of a river, Mr. Lewis?

A. As taken from this note it is the line drawn between
471 the two points which are nearest to each other, one upon Point Adams and the other upon Cape Disappointment.

Q. Then, you understand the mouth of the Columbia River to be that portion of the water which would be covered by a line drawn from Cape Disappointment down to Fort Stevens?

—. It is marked to Point Adams.

Q. To Point Adams; it is the same thing.

Senator FULTON: That is the extremest point of each?

WITNESS: Yes sir.

Q. When you fixed your line a marine league due west of the north ship channel, what date did you take for that north ship channel?

A. The point which you describe was fixed upon the map as shown in the answer at the point midway between the deepest contours which——

Q. I don't think you got my question.

The question was read to the witness.

A. March 1905.

Q. Was there a ship channel north of Sand Island in 1905?

A. There was a channel north of Sand Island in 1905.

Q. Could that channel, as shown by any maps which have come under your observation, be used by sea-going vessels?

A. Not that I am aware of.

Q. The channel through which you have passed your line as claimed by Oregon as its boundary, cannot at this time be used by sea-going vessels?

A. Not that I am aware of.

Q. You know as a matter of fact that it cannot, do you not, Mr. Lewis?

A. I have not been over there within recent years.

472 Q. Yes, but you can tell by an examination of these maps which have been introduced in evidence that there is not sufficient water there to admit of sea-going vessels passing through that course as shown by this line?

A. Yes sir.

Q. And you know as a matter of fact that north of Sand Island the water there is not over 3 or 4 feet deep at low water?

A. I can't swear as to that point.

Q. Well the maps so show it don't they, Mr. Lewis? Take the latest maps there and give me the ruling depths north of Sand Island.

A. On Oregon's Exhibit No. 6, dated March 1905, I find the ruling depths to be 12, 14, 7, 5, 6, 4, 5, and then deeper.

Q. Those depths which you have just given are mean low water depths?

A. As shown by a note on the map referred to, the soundings are in feet and show the depth at the mean of lower low waters.

Q. And you know, Mr. Lewis, that the channel north of Sand Island is constantly decreasing in depth, don't you?

A. I assume that it is.

Q. From your study of these various maps and your study of

this question, you find, do you not, that Sand Island has been continually moving towards the north?

A. Yes.

Q. And that the water north of Sand Island is constantly decreasing in depth.

A. I assume that it is.

Q. Now, if you had drawn your line from Cape Disappointment up the river as of the date of the admission of Oregon into the Union, which was 1859, the line would go very much farther south than is now shown on the map attached to the answer of the
473 State of Oregon?

A. It would have begun at approximately the same point and passed farther south than is shown in the answer.

Q. It would have passed south of what appears on this map as Sand Island, would it not?

A. No sir, it would not.

Q. Would it have passed north of where Sand Island now is?

A. It would pass apparently through part of the Island.

Q. You heard the testimony of some of the pilots yesterday, who stated that the course of the channel in going up the river would be from a point very close to Cape Disappointment, almost in an easterly direction and within a few hundred feet of Sand Island as shown on Oregon's Exhibit No. 5?

A. Yes sir.

Q. If that be true, and your line had been drawn in accordance with that course, it would have passed south of the present Sand Island?

A. It would have passed probably south of the larger part of Sand Island.

Q. As it exists at the present time. I mean south of Sand Island as it is shown on Oregon's Exhibit No. 6, of course?

A. Yes sir.

Q. The line which is delineated upon the map which is made a part of the State of Oregon's answer is produced in a westerly direction from a point just south of Cape Disappointment, out into the open sea and is then produced at an acute angle in a southeasterly direction. Will you kindly state what the significance is of this production of the line southerly.

A. The straight line running west from a point opposite the middle of the mouth of the ship channel is drawn to a scale and represents one marine league due west, and the line going southerly is simply to indicate the termination of that line and the
474 western edge of Oregon.

Q. Which is the point that you claim is one marine league due west of the north ship channel? Is it the point at the acute angle, or is it the point produced farther south from that?

A. It is the point at the acute angle in the ocean.

Q. That, as I understand, then, is the point that you claim is one marine league due west and opposite the mouth of the north ship channel?

A. Yes sir.

Q. In drawing this line, which is claimed by the state of Oregon as the boundary line, as shown on this map attached to the answer of Oregon, did you follow the present ship channel used by boats and ocean going steamers in the navigation of the Columbia River?

A. I followed the channels and courses and described in the description of the boundary line of the state of Oregon as it lies in the mouth of the Columbia River.

Q. Well, how about this line up the river after you pass Cape Disappointment?

A. It follows the channels and courses that I have just described.

Q. What channels and courses?

A. The middle of what remains of the north ship channel of the Columbia River; thence easterly to and up the middle channel as it existed prior to the admission of the state and so much of it as still exists at this time, as shown by the latest maps.

Q. I will ask you to state whether or not ocean-going steamers could use the channel as shown by the line delineated on this map attached to Oregon's answer and marked "Boundary Line."

A. I assume from the soundings and what I heard of the testi-
mony yesterday that with a little dredging the larger part of
475 this channel could be used. The channel north of Sand Isl-
and would at the present time require considerable dredging before it could be used by ships.

Q. Without artificial aid, could ocean-going steamers follow that channel as shown by your boundary line?

A. They could not.

Q. Did they ever follow that course?

A. I can't say as to that point.

Q. Is it not a fact that upon all the maps published by the Government and which you have examined that the soundings, beacons and buoys, etc., indicate that ocean-going steamers and vessels in passing up the river follow a line very much farther to the south than the boundary line as claimed by Oregon and which went close to Astoria and Tongue Point?

A. You speak with reference to present conditions?

(The question was read.)

A. Upon the map designated as Oregon's Exhibit No. 4, which is the latest map I have seen prior to the admission of the State of Oregon, it would appear that ships could go up north of Sand Island, thence passing easterly close to Point Ellice, thence continuing northeasterly through what appears to be the middle channel, as well as they could have come through the south channel passing close to Astoria?

Q. Well how about the channels at that time up the river beyond Point Ellice?

A. I have been unable to find any map being a continuation of Oregon's Exhibit No. 4 bearing approximately the same date of 1851.

Q. Before we pursue that point further, let me ask you what are the sailing directions indicated upon this map, Oregon's Exhibit No. 4?

476 A. Do you want me to read them to you?

Q. Just state so that the record will show clearly.

A. By the different lines drawn upon the map, it appears that lines are drawn for the guidance of ships passing up either channel that I have before described.

Q. Have you got a map here of 1854?

A. This one here.

Q. What are the sailing directions on that map, Oregon's Exhibit No. 5?

A. The lines as shown on this map, which I take as range lines for the guidance of vessels, show that both the north and the south channels were used at that time.

Q. Which do you refer to—the range lines or the sailing lines?

A. I refer to the sailing lines; also the range lines, for the reason that the sailing lines have, in addition to the range lines, various buoys marking the channel upon Oregon's Exhibit No. 5.

Q. Are there any sailing lines up to Chinook point on maps of about this date?

A. Oregon's Exhibit No. 4, date 1851, it appears that all the lines thereon are range lines; no sailing lines being shown that I observe at the present time.

Q. On what map nearest to 1851 do sailing lines appear or 1859?

A. I see some sailing lines on Oregon's Exhibit No. 5, or what I would take to be sailing lines.

Q. I mean, Mr. Lewis, up to Chinook Point.

A. But on the map Oregon's Exhibit No. 4, I fail to see anything marked as sailing lines.

Q. Are there any directions or instructions on the map marked Oregon's Exhibit No. 4, which would indicate whether or not vessels passing up the river would go north or south of the sands marked on that map as "bare at low water"?

477 A. I find in a hasty examination of the sailing directions no reference to sailing directions passing north of the point marked "bare at low water," except "Navigators will observe the ranges as shown on the chart and govern themselves in their positions with reference to the winds," which indicates that they could go up any of the channels shown by observing the ranges as outlined.

Q. From an inspection of Oregon's Exhibit No. 4, and the sailing directions thereon, would you give it as your opinion that at the date when this map shows it to have been surveyed that vessels pass north of the sands marked on this map "bare at low water"? Or is it not a fact that they would pass south of that?

A. I assume that it would depend upon where they were going as to which channel they would take.

Q. Passing up the river to Portland?

A. Yes sir.

Q. Which would they take? Which course would they take?

A. From the sailing directions as given on Oregon's Exhibit No. 4, I assume that they would go where the lines and channels were best described——

Q. Which would that be with reference to this sand?

A. — which would probably be the south channel, but from all appearances the north channel appears wider and fully as deep and I can see no reason why they should not go up either channel.

Q. That is, so far as is shown on sheet No. 1, the entrance of the Columbia River, Oregon's Exhibit No. 4; is that right?

A. Yes.

Q. Now, then, assuming that a vessel did pursue that north channel and got up as far as Point Ellice, could it get up the river to Portland at that time?

A. I assume at that time that a ship going as far as Point
478 Ellice could have continued on up the river, for the reason that any channel, in order to keep itself open, must receive water through some other connecting channel; therefore, there must have been a connecting channel beyond the terminus of this map.

Q. Just take the maps, Mr. Lewis, and tell us what they show with reference to that channel. Take the nearest map of that date and let us know what it shows.

A. The nearest map to 1851 which connects up the river, I assume, is marked here Oregon's Exhibit No. 7.

Q. What is the date of the hydrography of that map?

A. The date of hydrography is 1867 and 1868. Oregon's Exhibit No. 7, shows that there is a well-defined channel, which would connect with the north channel and extension or middle channel as shown upon Oregon's Exhibit No. 4.

Q. Does the map show that this northerly channel is of sufficient depth to admit of the passage of ocean-going vessels? I mean the channel shown on Oregon's Exhibit No. 7.

A. At the point where I assume the channel is shown on Oregon's Exhibit No. 4, would connect, it appears that there is 3¼ fathoms of water, which is sufficient to float an ocean-going vessel of considerable draught; and from there easterly for a considerable distance I notice a continuation of this channel. But for a short distance southwesterly from what is marked on Oregon's Exhibit No. 7, as Yellow Bluffs, I notice at the present time, without dredging, that a ship of only 11 feet in draught could pass over the bar.

Senator FULTON: That is at low tide?

WITNESS: At low tide.

Q. That is, that condition obtained in 1875?

A. 1867 and 1868.

479 Q. I mean 1867 and 1868.

A. Yes sir.

Q. And that map from which you have just testified, I understand you to say is the nearest publication showing that portion of the river after the admission of Oregon into the Union?

A. It is the nearest that I know of.

(Recess until 2 o'clock P. M.)

Q. Mr. Lewis, will you be kind enough to state what the ruling depth of the channel was from Cape Disappointment to Three Tree

Point at the time of the admission of the State of Oregon into the Union, or at the nearest date of which you have data.

A. The map of nearest date to the admission of the State of Oregon is that shown as Oregon's Exhibit No. 4, dated 1851.

Q. What is the ruling depth of the channel through which your Boundary Line as claimed is drawn?

A. Through the channel as claimed by Oregon, from Cape Hancock it appears to be 3 2/3 fathoms.

Q. What is your definition of the term "Ruling depth?"

A. I would assume that it is the shallowest depth, being at mean low water.

Q. What is the ruling depth of that channel at the present time?

A. I am not aware that we have any map showing it.

Q. Take your last Exhibit. What is the ruling depth of the channel at the present time—I mean the channel through which your boundary line (as claimed) is drawn, from Cape Disappointment to Knappton?

A. It is impossible to say what that is at the present time, but from Oregon's exhibit No. 6, which shows the hydrography for 1868 and 1869, the ruling depth would be about four feet
480 at mean of the lower low water—this being the shallowest depth encountered.

Q. At the present time it would probably be less than that shown on Oregon's Exhibit No. 6?

A. I can't say as to that.

Q. That is your opinion as to that?

A. No, it is not.

Q. Is it not a fact, Mr. Lewis, that the channel north of Sand Island is carrying a less depth year by year, filling in there?

A. I can't say how it would act. The channel you know, is filled up with fish traps; and with a narrow channel, if there is any current at all, it might tend to increase the depth.

Q. Now I wish you would give us the ruling depth from Knappton up the river as of the nearest date to the admission of Oregon into the Union, of which you have information or data.

A. The only information showing the depth of water in the channel as claimed by Oregon, that I know of, is shown on Oregon's Exhibit No. 7, which shows that a boat drawing 11 feet of water at low water could get through.

Q. Then, the ruling depth is 11 feet, as I understand it?

A. Yes sir.

Q. And what date is that?

A. The hydrography of 1867 and 1868.

Q. Are you able to state what the ruling depth of that channel, as claimed by Oregon is at the present time, or any later date than that shown on Oregon's Exhibit No. 7?

A. The shallowest water in the channel as claimed by Oregon occurs——

Q. No, no. You have given us the ruling depth of this channel from Knappton up the river as of the date of 1867. Now can you give me the ruling depth of that channel at the present time?

481 A. It is impossible to say as to that at present.

Q. What is the latest information or data that you have on that matter after 1867?

A. I have no information whatever but the map.

Q. Oregon's Exhibit No. 7, is the only information that you have on the question so far as the channel above Knappton is concerned?

A. Yes sir.

Redirect examination.

By Mr. CRAWFORD:

Q. Something was said and you testified concerning Sand Island having moved or changed. You may state whether Sand Island has entirely changed since 1868 as shown by the United States surveys and maps in evidence.

A. With reference to Oregon's Exhibit No. 9, and Oregon's Exhibit No. 6,—first, the map nearest to the date 1868, did you say?

Q. Yes.

A. And the present map, shows that a small part of the Island still remains where it was at the earliest date, but that the larger part of the Island has moved to the northward a considerable distance.

Q. The Island is considerably larger than it was formerly, is it not?

A. Yes sir it is.

Q. And has evidently built up from the north side and has wasted away on the south?

A. It would appear to have grown in that way.

Q. You spoke of the map being made or issued in 1905. You may state when the hydrographic survey was made and the data secured from which said map was published or issued.

A. The hydrography was procured in 1868 and 1869.

482 Recross examination.

By Mr. MACDONALD:

Q. Is it not a fact, Mr. Lewis, that the northerly part of Sand Island as it existed in 1858 is farther south than the most southerly part of Sand Island as it exists at the present time?

A. It is.

Q. Therefore, you would not say that Sand Island as it existed in 1858 is the same Sand Island which is known as Sand Island at this time?

A. I would not, I was speaking with reference to 1868.

Q. I am speaking now of 1858. You would not say that the Sand Island of 1858 was the same Sand Island which exists at this time?

A. It is the same island in a different place.

Q. Well, you would not say that that particular sand moved in the river and assembled itself again—the identical sand—where Sand Island is now, would you?

A. It is impossible to say.

Q. It is a fact, is it not, that that original Sand Island simply washed away and the sand scattered hither and thither, and other sand gathered to form the present Sand Island?

A. It was probably formed by accretion to the north side.

Q. So that it is a new island?

A. There has always been a sand island there.

Q. Certainly.

A. The same island.

Q. Do you say that Sand Island as it now exists is the same island that existed two or three miles further south in the river in 1858?

A. Except a different location.

Q. The same sand, you think, moved right up there, did it?

483 A. The island has been added to on the northward by accretion.

484 ROBERT CARRUTHERS being duly sworn as a witness on behalf of the defendant, testified as follows:

Direct examination.

By Attorney General CRAWFORD:

Q. Where do you reside?

A. I live in Astoria at present.

Q. How long have you lived here?

A. I came over here in 1877 from Shoalwater Bay.

Q. Were you acquainted with the Columbia River as it was prior to 1877?

A. I came to this country in 1854.

Q. You may state whether you have been acquainted with the Columbia River, the mouth of it since 1854.

A. We moved down the Columbia River from Portland in 1854.

Q. What is your business?

A. I was raised on a farm over on North Beach principally; quite a number of years there.

Q. Have you been engaged or employed on the river?

A. No.

Q. You may state what, if anything, you know about ships sailing up the north side of Sand Island and up the southern shore of the State of Washington through what is called the north channel?

A. We moved down here in June; we came down on the Cathlamet side, Washington side; came down from Gray's Bay and around by Point Ellice and down the inside channel to Ilwaco. That wasn't the north channel though. There was a channel inside. Chinook Spit was outside. Chinook Spit was about where Sand Island is now.

Q. That was the inside channel, was it?

A. Yes sir, the inside channel, north of the north channel.

485 Q. North of Sand Island?

A. North of the north channel. Of course that would have to be north of Sand Island too.

Q. Where was the north channel then?

A. It was south of Clatsop Spit.
Q. South of Clatsop Spit?
A. Or Chinook Spit; between that and Sand Island.
Q. You may state whether there was a well-defined channel through there in those days.
A. Well, that is where about all the ships came in when we moved down there.
Q. And up to what date did they cease coming through that way?
A. I think along about 1883 or 1884, somewhere along there. I think the Indiana came in 1881 or 1882, as near as I can remember, and I think she was the last deep-loaded ship, American ship, that I have any knowledge of coming through there. I guess she was the last deep craft that came around there. It might have been 1881 or 1882, possibly.
Q. Since that date, that has been gradually shoaling up?
A. Yes sir.
Q. You may state about what draught of vessels could come down the river the way you did at the time you say you first came.
A. Well, that was pretty small. I would undertake to say that. There was a channel there, but how deep it was I couldn't say.
Q. You may state whether in those days there was a good, deep north channel as far up as Three Tree Point?
A. I don't know anything about up the river above Chinook Point.
Q. Above what?
A. Chinook Point.
Q. Up to Knappton?
A. Up to Knappton or Point Ellice.
486 Q. Well, how far up to Knappton?
A. I don't know as I ever saw any vessels in the early days sail up that way, because they crossed over and come up above Sand Island and crossed over into the south channel.
Q. Then, all you know is simply vessels came in from the ocean north of Sand Island and then sailed across?
A. I have seen vessels go up some, up the north side, in early days, but how deep draught vessels I couldn't say.
Q. Were they vessels which came in from the ocean?
A. Yes sir, but as a rule they came over here from Sand Island into the south channel.
Q. You have seen them go up the other side?
A. Yes, I have seen vessels go up that way.

Cross-examination.

By Mr. MACDONALD:

Q. It is a fact, is it not, Captain, that in all the years which you have lived on this river that the channel or course usually and customarily followed by ocean-going steamers was the south channel?
A. No sir, it was not.
Q. What was the channel used?
A. It was the north channel in the early days.

Q. What is the channel used at the present time?
A. The south channel. There is no north channel.
Q. There is no north channel?
A. Not at this time down there, no.
Q. Isn't it possible for any vessels to use the north channel?
A. Yes, it is possible. There are vessels going down there.
Q. Is it possible for an ocean-going steamer at all times to use the channel north of Sand Island?
A. They can't use it if there isn't water enough.

Q. Isn't it a fact that the water north of Sand Island at
487 low water is only three or four feet deep?

A. I don't know as it is that deep.

Q. What opportunities did you have for knowing this channel that you speak of as the north channel, which you have said was a well-defined channel?
A. I have seen vessels very often. I have seen the Indiana when she was towed up through there. I have seen vessels up at the Cape there sail up before there were any tugs; beat down.
Q. You had no occasion to make measurements of that channel, had you?
A. No, but the vessels sailed along. I guess they didn't hit the bottom.
Q. Could you indicate on these maps the course of those vessels that sailed up the north channel?
A. If you had a map about the 50's or 60's, along there.
Q. Here is a map of 1854, being Oregon's Exhibit No. 5. Just indicate on that map the course which ocean-going vessels and steamers usually followed.
A. Where is the rest of it? Where is the Cape?
Mr. MACDONALD: Here is the Cape.
Mr. CRAWFORD: Here is Point Adams and here is the other cape.
WITNESS: Where do you get Sand Island?
Mr. CRAWFORD: Sand Island is here. (Pointing on map.)
WITNESS: Here is the lighthouse here. A vessel coming up this north channel wouldn't shut in by the Island. You could see them coming all the way. You can stay up by the light and see them come up the channel. Of course now the way Sand Island is, it is away from here. They would shut in now at least three miles. If there was deep water around there it would be as much as three miles around that way.

488 Q. Referring to Oregon's Exhibit No. 5, it is a fact that when you first came on the river in the early years, the usual course followed by steamers was to come in close to Cape Disappointment and then go in an easterly and southerly direction close to the east end of Sand Island, and then down toward Point Adams and up the Oregon shore?

A. Well, they would come around the north channel here.
Q. I think you can answer that question by Yes or No, and if you can I would be glad to have you do so. (Pointing on map the course indicated in the question.)
A. Well, I guess that is about right.

Q. Referring to Oregon's Exhibit No. 6, I will ask you if you have ever known of ocean-going steamers or vessels taking or pursuing a course in going up the river which would carry them north of where Sand Island is at the present time?

A. Well, I don't know as they did go there but I have seen vessels lie right in the Bay here, a good many of them, anchored.

Q. Years ago there was a good anchorage close to Cape Disappointment in Baker's Bay?

A. Yes, pretty good anchorage there.

Q. And vessels in stress of weather and storm would come in there and anchor?

A. Yes sir, that is right.

Q. Now just tell me whether or not you have ever known of vessels using a course in going up the river which would carry them to a point north of where Sand Island is at the present time.

A. Why, no, they were beating; they might stand over there beating up channel.

Q. What I mean is this: Did they ever use a course that would take them up in going up the river?

489 A. There is nothing to hinder them. If a vessel is beating she takes a good many courses from the straight course she wants to go. She has got to go according to the wind if there is no tug boat ahead of her.

Mr. MACDONALD: You don't understand what I mean.

Mr. CRAWFORD: You don't understand what the Captain means.

Q. I will ask you if you have ever seen steamers pursue a course which would take them north of where Sand Island is now if they are going up the river?

A. Well, as a rule, a vessel don't go miles out of the way just to see.

Q. That is not an answer to my question.

A. No sir, a vessel goes straight up the channel generally.

The following question was read: I will ask you if you have ever seen steamers pursue a course which would take them north of where Sand Island is now if they are going up the river?

A. Well, I have seen them take that course when they were landing at Ilwaco.

Q. Did you ever know of ocean going steamers, coming into Ilwaco, landing there, and then going up the river through the east side of Baker's Bay?

A. The only boat I ever see land there was the "General Miles" and she had a route there.

Q. When did she come in there?

A. Used to run there about 20 years ago.

Q. How much water did she draw?

A. Drew about 12 feet.

Q. Did you ever see any other ocean steamers come in and land at Ilwaco and pursue their course up the river through Baker's Bay?

490 A. Outside of her there is nothing for them to land there for.

Q. Now that is not an answer to my question. I wish you would answer my question.

The following question was read: Did you ever see any other ocean steamers come in and land at Ilwaco and pursue their course up the river through Baker's Bay?

A. They didn't land there, outside of the "General Miles;" I said she landed there.

Q. Then, as a matter of fact, you never saw any ocean going vessels come in and land at Ilwaco, except the General Miles, and that was 20 years ago?

A. No, I don't think I ever did.

Q. Then, you have never seen any ocean going vessels except this General Miles go up the river by a course which would take them through all of Baker's Bay north of Sand Island?

A. That is a queer question, because they couldn't go through all the places. They would have to take one course; they couldn't take all the courses. There are a good many courses they could take. There was lots of room in the early days. They could take a great many different courses.

Q. It never was the custom of vessels in coming to Astoria or to Portland to pass through Baker's Bay and north of Sand Island as it exists at the present time?

A. They went north of Sand Island.

Q. As it exists at the present time?

A. No, I don't say that.

Q. When you say "north of Sand Island" you mean old Sand Island which was some very considerable distance south of the present Sand Island?

A. Yes, several miles.

491 Redirect examination.

By Attorney General CRAWFORD:

Q. You may state whether, when you answered in your direct examination in regard to Oregon's Exhibit No. 5, that vessels in going up the river frequently come around Sand Island and back towards Point Adams, that was your intention.

A. That is right.

Q. Or whether you intended to say that they would come down, passing Point Adams at a considerable distance out in the river and sailed towards Astoria.

Senator FULTON: You don't mean Point Adams.

Mr. CRAWFORD: Yes Point Adams.

Senator FULTON: Point Adams is outside on the ocean.

Mr. CRAWFORD: I know, but that is what counsel had him testify,—that they would come around Sand Island and back towards Point Adams.

A. When they come around Sand Island to get into the south channel they would have to stand over towards Fort Stevens.

Q. But what was their general course? Would they go up towards Astoria, up the river, or come back towards Point Adams?

A. They come over on this side and head up the river towards Astoria.

Q. In other words, they would come over to the south channel in order to reach Astoria?

A. Certainly.

Q. That is the way you intended your testimony to be understood.

A. Yes sir.

Recross-examination.

By Mr. MACDONALD:

Q. These boats would come down the east side of old Sand Island and come within a few hundred feet of Fort Stevens in going up to Astoria?

492 A. It was not necessary to come right close in to Fort Stevens.

Q. Will you kindly answer my question?

A. I said they didn't always go close in, they didn't have to.

Q. Well, they customarily went close to Fort Stevens?

A. They went closer to Fort Stevens than to Desdamona Sands.

Q. They would go within 400 to 500 feet of Fort Stevens, would they not?

A. Some might, and some might go half a mile from there. They didn't always take the same course, you know.

Q. And in passing up the channel to Astoria, these ocean-going steamers would go within a few hundred feet of Tansy Point, would they not?

A. Well, some would and some could keep off further, because the channel is a pretty good width there.

Q. As a usual thing they came within a few hundred feet of Tansy Point?

A. No, I don't know that they did as a usual thing.

Q. Where did they go as a usual thing?

A. Generally kept the middle of the channel, about a quarter of a mile out.

Q. Then they came within a quarter of a mile of Tansy Point?

A. Probably.

Q. If any of the pilots have testified that the customary and usual course was within 150 feet of Tansy Point, they would be wrong, would they?

A. I don't say they would, because they could go where Flavel wharf is now; there is 26 feet of water there.

Q. You never were a pilot on the river?

A. No sir, never was a pilot.

Q. Nor captain?

A. I was captain of my own vessel once; I owned it.

493 Q. Was that on the river here?

A. No sir.

Q. In Shoalwater Bay?

A. No sir.

Q. Where?

A. Here in the harbor; she is an ocean-going vessel.
Q. And you were captain of that vessel?
A. Yes sir, and owned her.
Q. Navigated her?
A. Yes, a little.

494 C. S. GUNDERSON being duly sworn as a witness on behalf of the defendant, testified as follows:

Direct examination.

By Senator FULTON:

Q. Capt. Gunderson, state your age, residence and occupation.
A. 52; Astoria; pilot on the bar, and the river as far as Knappton and Astoria.
Q. The Columbia River bar?
A. Yes sir. The river as far as Knappton and Astoria.
Q. How long have you been employed in that occupation?
A. As pilot, started in first in 1881, and most of that time since as pilot.
Q. Were you employed working on the water in any capacity prior to that?
A. I started in as a deck hand on bar tug-boats in 1877, till 1878.
Q. You had the same opportunity as deck hand to observe the currents, the channels, the bar, and the river that you would have as a pilot, had you not?
A. Pretty near; not quite.
Q. You would have the same opportunity, but perhaps would not give as much attention to it as a deck hand?
A. Yes, that is the idea.
Q. When you first became acquainted with the bar and river how many and what channels were there at the entrance?
A. There were two for a while.
Q. What were they?
A. The north and the south channels.
Q. Up to what time?
495 A. Until about 1880, and then the South channel closed up again and they used the north.
Q. And the south channel then closed?
A. Yes sir.
Q. Was that after the commencement of the construction of the Jetty, that it closed, or before?
A. It was before.
Q. Did it open up again—the south channel?
A. Not in its old place.
Q. Did it open up in another place?
A. Yes.
Q. Well how was the river, as far as you were familiar with the conditions prevailing there in regard to channels?
A. The north channel was the one used by deeper ships even at

the time we used the south channel, and kept on until 1882 when it shoaled up around Sand Island; but we kept using the north channel up to 1886?

Q. For ships?

A. For ships.

Q. That is, going around the north of Sand Island?

A. Yes.

Q. Then, when you first entered upon the work of deck hand and afterwards of pilot, the north channel laid around to the north of Sand Island?

A. Yes sir.

Q. Between Sand Island and the Washington shore?

A. Yes sir.

Q. And that was the regular channel for deep ships?

A. Yes sir.

Q. Now, on up on the north side was there a channel?

A. Yes, a channel as far as Knappton, to my knowledge, a better channel than to Astoria.

496 Q. Above that, I understand, you have not been acquainted?

A. No, I don't profess to know anything about that.

Q. You don't sail or navigate above that?

A. No.

Q. I assume you know nothing about the channel above Astoria on the south side?

A. No sir, I am not acquainted with it.

Q. Simply because, as bar pilot your grounds do not extend beyond Knappton on the north side and Astoria on the south side?

A. Yes sir.

Q. How did I understand you to say that the north channel up as far as Knappton compared with the south channel up to Astoria?

A. There is about three feet more of water on the shoalest point of the north channel leading up to Knappton than there is in the channel leading to Astoria.

Q. Do you know whether or not, as a matter of fact, sea going vessels have at times gone up through the north channel of the river to Portland?

A. Above Knappton?

Q. Yes.

A. I don't know anything about it.

Q. How is that south channel between Astoria and the sea at the present time?

A. It is shoaling up very fast, and if you don't dredge that pretty soon we won't have any channel at all.

Q. If they don't dredge it shortly it will be closed?

A. That is right.

Q. Closed to deep sea-going vessels?

A. Yes.

497 Q. That is due to its filling with sand, is it?

A. Yes; it may be caused by the dredge working up above

here and depositing its load, or else the current takes it down in the south channel.

Q. Is there a dredge employed frequently in the south channel above Astoria?

A. Above Astoria there is one employed most all the time.

Q. That is the way that channel is kept open for the accommodation of sea going vessels between here and Portland, is it?

A. To be sure.

Q. There never has been any dredge employed in the north channel has there, that you know of?

A. No. Well, the tugs used to drag a harrow-shaped affair down at the head of Sand Island for some years?

Q. But I mean above Knappton.

A. Above Knappton?

Q. Yes.

A. I don't know anything about it.

Q. There is no port or considerable town or city on the north bank of the Columbia River below Vancouver, is there?

A. Not of any extent.

Q. I will say below Kalama?

A. There is a saw mill in there.

Q. But there is no place furnishing any business for shipping other than the saw mill?

A. No, except at Kalama, where they have railroad iron occasionally.

Q. How far up the river is that?

A. Oh, about sixty miles.

Q. That is a great distance above Three Tree Point is it not.

A. Oh, my, yes.

498 Q. About how far above Three Tree Point?

A. About 40 or 50 miles.

Q. And below Kalama there is no port or town supplying any business for shipping on the north side?

A. No.

Q. This place you speak of as Knappton, what is that?

A. That is a saw mill, and a quarantine station below that.

Q. Just one saw mill there, isn't there?

A. That is all.

Q. No other business there than this one saw mill, is there?

A. No, that is all.

Q. No people living there except such as are employed about the mill, are there?

A. As far as I know there are not.

Cross-examination.

By Mr. MACDONALD:

Q. There are quite a number of canneries up there, are there not on the north shore of the river, Brookfield, etc.?

A. Yes, there are some canneries.

Q. At McGowan's?

A. That is below.

Q. I am just taking the various points along there,—McGowan's, Chinook, Brookfield and Ilwaco.

A. Yes. It is not running though, I think.

Q. It has been running in recent years, has it not?

A. I haven't been there in recent years, so I can't tell.

Q. Did I understand you to say that deep sea-going vessels and steamers had been accustomed to pass up the river over a course which took them north of Sand Island?

A. Yes.

Q. When you speak of that course being north of Sand
499 Island you refer to the old Sand Island and not to the present Sand Island?

A. I refer to the — Sand Island.

Q. Did you ever know of a vessel passing over a course which would take it north of the most northerly point of Sand Island as it exists at the present time?

A. I don't know of any.

Q. I will ask you to step over to the table, Captain, and look at Washington's Exhibit A for identification, and tell me whether you ever knew, or heard, or saw a sea-going vessel take a course which would be indicated by this line drawn in blue and marked "Boundary Line as claimed by State of Oregon."

A. Hardly as far in as that. (Indicating hardly as far in as Sand Island.)

Q. I call your attention to this line in red commencing out in the ocean and which is marked "Channel line 1854." You see the line that I am referring to now?

A. Yes.

Q. I will ask you if that is not the course which vessels took passing north of Sand Island as described by you a few moments since?

A. It is the year I was born; I really don't know what happened then.

Q. I just mentioned 1854, because that is the name or date that is given to this line in here. As I understood you to testify a few moments ago, you said that ocean going vessels in going up to Astoria and Portland came from the ocean and took a course which carried them north of Sand Island.

A. Yes. But they started up here; they didn't come from there. (pointing on map.)

Q. Where did they start?

A. They started in this vicinity.

500 Q. You mean they started from the end of this blue line marked "Boundary Line as claimed by Oregon"?

A. About there, yes.

Q. And then they passed along the course indicated by this blue line, did they?

A No, they had to go around Peacock Spit. That is indicated there now as being very small, but at the time I speak of in 1877 and 1878, that Spit had grown and formed out here, still going out; and ships had to come from here with a buoy and follow in between this middle ground that had receded some, and this Peacock

Spit was formed out here; so they came in like this and then went up.

Q. When they got to a point just south of Cape Disappointment, we will say at a point where the word "Breakers" appears just south of Cape Disappointment, then they passed up a course practically shown by this red line from that point, or did they not?

A. No, they did not.

Q. Just indicate the course they took?

A. They would haul up; after they passed this point of Peacock Spit, they would haul up——

Q. Just above the word "Breakers"? You see Captain, we have got to get this all into the record.

A. I understand.

Q. The word "Breakers" in black, just a little bit north of that.

A. I should judge so, yes, from the general appearance of this.

Q. Now just go on and indicate it?

A. Then they came up here, passed across this point here, and then went up; here is Chinook Point. Well we went just
501 in about that shape. (Indicating.)

Q. Practically a straight line from the words "Fort Canby" to "Chinook Point"?

A. Yes, a little bit below Chinook Point.

Q. A little bit below Chinook Point as shown on this map, Washington's Exhibit A for identification?

A. Yes.

Q. And that was in what year, Captain?

A. That was in 1877, 1878 and 1879.

Q. Now I wish you would give a history of the course of this river from that time to the present.

A. Of that course?

Q. Yes.

A. Leaving the Cape?

Q. No, just coming over the bar. They don't use the same course at the present time, do they?

A. No.

Q. The course has changed?

A. The course has changed; it changes every year.

Q. Now tell us the various changes that have occurred since 1877 and the years you have just spoken of, coming in from the ocean.

A. From 1877 to 1878 and part of 1879 they used the south channel a good deal.

Q. Now will you indicate on this map, Washington's Exhibit A, what you term the south channel?

A. Yes. In 1877, 1878 and 1879 we could go down to the south or the south by east, by compass—of course you understand we had to go according to the tide, but then it was general directions; it was just about south by east by compass from the Cape, right out to sea after passing Clatsop Spit. (Pointing on map.)

Q. This is Clatsop Spit here.

A. Yes.

Q. How long did you continue to use that course?

A. Till about 1880.

502 Q. Then what course did you use?

A. Then we went out the north channel.

Q. Then what course did you use after that?

A. Well, in 1882 the north channel was shoaling up; the south channel was closed, and we then went out—I know I had the pleasure of taking a very deep ship right out over what they call the Sands, right out west.

Q. I wish you would indicate on the map the present channel used by ocean-going steamers and vessels, in coming from the ocean to Astoria.

A. Have you a map there?

Q. This is the latest map right here, Captain. Commencing at a point, we will say, where this dotted red line and the black line meet out in the ocean at whistling buoy. I wish you would tell us what is the usual course now pursued by ocean-going craft in going to Astoria.

A. It depends a good deal on the sea and the draught of the vessel. I want to be understood that while some vessels can go nearer to shoals to advantage, others have to keep right into this water.

Q. Take the largest steamers and those drawing the most water, what course would they pursue from the whistling buoy in going up the river? You can see all those whistling buoys and lights, etc., on the map. (Pointing to same.)

A. Yes. Practically run along that black line.

Q. Then, I understand you to say that the present channel as used by ocean-going steamers is practically as shown by this black line marked "1905 channel line"?

A. Practically along that line.

Q. And that line, from the whistling buoy out at sea to Astoria, as shown on this map, practically shows the course followed

503 by the ocean-going vessels in coming into Astoria?

A. Yes sir.

Q. And how long has that channel or course been used?

A. Well, it was only last year they shifted No. 8 and No. 6.

Q. I mean just as a general proposition.

A. Four years.

Q. And since 1895 those ocean-going vessels and craft have used a channel which brought them along that course or perhaps south of it in crossing the bar?

A. Yes.

Q. I wish you would be good enough to state in what year vessels last took a course in coming in from the ocean which would carry them north of that black line marked "1905 Channel line."

A. In 1886.

Q. In 1886, vessels coming in would take a course——

A. North of Sand Island.

Q. North of this channel line in black?

A. Yes.

Q. I will ask you whether or not it is possible at this time for an ocean-going steamer to pass north of Sand Island?

A. I would not undertake it.

Q. It is a fact, is it not, that at low water the channel becomes as shallow as three or four feet?

A. I don't know, I haven't been in there.

Q. But no vessels use that course now north of Sand Island in coming from the ocean?

A. No what we call ocean-going ships.

Q. Can you tell us the average draft of vessels passing over the bar here?

A. That is a conundrum.

Q. Well, about what do they run?

504 A. They run from 6 feet up to 26 feet.

Q. I understand you to say that the channel out here in front of Astoria was getting very shallow?

A. Yes sir.

Q. Is it not a fact that the most shallow point in the channel in front of Astoria is deeper than the ruling depth on the bar?

A. No.

Q. What is the ruling depth on the bar at the present time?

A. About 20 feet.

Q. And what is the ruling depth in the channel out here in front of Astoria?

A. About the same. Speaking of low water, you know.

Q. Certainly; that means low water. Is it not a fact that at low water the depth in the channel opposite Astoria is 37 feet, and was last year?

A. No; it never was, to my knowledge.

Q. Then, if the government chart shows that to be 37 feet——

A. They are off.

Q. They are mistaken, are they?

A. Yes sir.

Q. You say about 20 feet is the ruling depth out there?

A. There is only 19 feet between Astoria and Tansy Point.

Q. I was speaking of the depth immediately in front of Astoria.

A. All right, confine yourself to that. They are wrong if they say 37 feet.

Senator FULTON: I desire to call attention to the fact that they are looking at the map, the hydrography of which was in 1868.

Mr. MACDONALD: I refer to Washington's Exhibit A, which states that the hydrography was executed between 1868 and 1899, and ask you, if this map shows the depth opposite Astoria to be 37 feet in 1899, if that is correct?

A. No.

Q. What was the correct depth? I am speaking, Captain,

505 of in front of Astoria here, the channel, in 1899.

A. 30 feet.

Q. So that this chart is in error at that point some 7 feet?

A. Yes.

Q. If the chart I have just referred to gave another point a depth of 59 feet, immediately in front of the city of Astoria would that be correct for 1899?

A. It depends on where it is. There is a hole down here off Elmore's cannery, where there are 10 or 11 fathoms of water. But that is just a pocket.

Q. And that is a very short distance, is it?

A. Yes.

Q. If the chart shows a depth of 45 feet opposite the city of Astoria for the year 1899, would that be correct?

A. Not at the shallowest place.

Q. Not at the shoalest place?

A. No.

Q. I wish you would state the draught of vessels which were coming in over the bar in 1885 and on to 1890?

A. About 23 feet.

Q. How does that compare with vessels coming in at the present time?

A. They are deeper now, because they are longer,—the ships are longer.

Q. I will ask you whether or not any ocean going vessels or steamers within the last five years, in going to Portland have used the course which would take them north of Desdemona Sands?

A. Not to my knowledge.

506 Q. It is a fact, is it not, that all of the ocean-going steamers going to Portland take this course south of Desdemona, out here in front of Astoria and up to Tansy Point?

A. If they have not got a clean bill of health and have got to go to quarantine station over near Knappton, they go here first.

Q. And then they come back and go up the river.

A. Yes.

Q. You are familiar with the work of the custom house I take it, and their mode of clearing vessels?

A. In a general way.

Q. Now supposing a vessel were at the quarentine station and desired to go to Portland, taking a course up along the north bank of the river, it would be possible for the captain of the vessel to come to Astoria and get his clearance without bringing his vessel there, would it not?

A. Well, I am not sure of that, what their rules are in regard to that.

Q. You are not positive in regard to that?

A. No.

Q. In your experience upon the river, did you ever know of ocean-going vessels using a course which carried them along the north bank of the river in going to Portland from Cape Disappointment up to Three Tree Point?

A. I have seen two barks go up in the middle channel.

Q. What draught were they?

A. About 14 feet.

Q. How close to the Washington shore did they go?

A. I wasn't on them, but from where I stood it looked as if they were about half way between the two shores.

Q. Half way between the two shores?

A. Yes.

Q. Did you ever know of any ocean-going steamers or vessels following a course which would be shown by this blue line
507 from Cape Disappointment up beyond Point Ellice?

A. No.

Q. I will ask you to state whether or not to your knowledge any ocean going vessel at any time ever pursued a course which would be shown by this blue line on Washington's Exhibit A?

A. They would approximate that up as far as Point Ellice.

Q. In what years?

A. Oh, up to 1885.

Q. Have any vessels pursued that course since that time?

A. Not to my knowledge.

Q. And they could not at this time by reason of the shoal water north of Sand Island?

A. As I said before, I would not undertake it.

Q. If the vessels used the course shown by this blue line in 1885 and before that, they would come within a quarter of a mile of the Ilwaco dock, would they not?

A. If they run to the edge of the channel they might, yes.

Q. I speak of the course that was usually followed by these ocean going steamers.

A. No, they wouldn't come that close.

Q. How close would they come?

A. It would be half a mile, anyway.

Q. Would it not be a little bit more than that?

A. It might even be that.

Q. How close would they come to the Chinook Spit as shown on this map, Washington's Exhibit A?

A. If you were not careful you might run on to it.

Q. Yes, but how close did they customarily go?

A. Chinook Spit is above Sand Island. They went near the Sand Island side.

Q. The channel has undergone a great many changes since you came on the river has it not.

508 A. Yes sir.

Q. And these changes are gradual, going on all the time?

A. At times; at times again it is quite sudden.

Q. In how short a time would there be a radical change in the channel?

A. In two days.

Q. I wish you would give us an illustration of such a sudden change as that?

A. A gale of wind blowing from the westward has deposited sand in planes where there was deep water.

Q. When did that occur the last time?

A. About a year ago.

Q. Where was that?

A. On the bar.

Q. Could you indicate it on the map, Washington's Exhibit A?

A. In here. It is near the Nun buoy commonly known as the middle bar buoy, and indicated on the map by the letter N.

Q. The buoy to which you have just referred is the second buoy from the end of this black line out in the ocean?
A. The second one from the whistling buoy.
Q. How much of a change occurred at that time?
A. Oh, about 2 feet.
Q. You mean by that, that a channel was made two feet shoaler?
A. Yes.
Q. Did the channel shift otherwise?
A. No; it was a lump came there.
Q. So that it was just a deposit of two feet of sand made in the channel?
A. Yes.
Q. The channel itself didn't shift or change otherwise than that?
A. It depends on how you take it.
509 Q. I am speaking of this very time now.
A. Yes, it shifted to that extent, we couldn't go there.
Q. I mean you used the same course over it, didn't you?
A. No we had to avoid that shoal.
Q. How much of a change in your course did you have to make?
A. We had to give it a good berth, say perhaps, 200 feet; shifted 200 or 300 feet.
Q. Did you go to the north or south of the old course?
A. According to the wind and tide.
Q. When did you go north and when did you go south?
A. If it was a strong southerly wind we went north of it and with a westerly wind, a westerly sea, we went south of it.
Q. How much further south did you go from your old course?
A. We went as near it as we could.

Senator FULTON: He said he avoided it about 200 feet.

Q. In going south you would go 200 feet away from your old course?
A. As near as we could come to that.
Q. And in going north, how far would you go from your old course?
A. I said that before, about 200 feet.
Q. So, whether you went north or south you went 200 feet from the old course?
A. As far as we could come to it. There is no fence.
Q. I understand that; you have to approximate those distances. Do you remember in what year the steamer Republic was wrecked?
A. Yes.
Q. What year?
A. 1879.
Q. Could you indicate on the map about the spot where she was wrecked.
510 A. It was on the 19th day of April.
Q. Take this government chart. (Showing witness small map attached to government report.)
A. Right there. (Pointing on chart).

Q. Now, could you transfer that over to this map, Washington's Exhibit A?

A. It was somewheres about there. (Pointing on Washington's Exhibit A.)

Q. Give us the direction and distance from the Cape. I just want it approximately.

A. No, I can't remember that. I have the bearings of it but I can't remember exactly the distance.

Q. Could you approximate it on the map?

A. Well, it is somewhere in that space.

Q. The wreck was at a point near the most southerly part of the middle of Sand Island as shown on Washington's Exhibit A?

A. Yes.

Q. You refer to that Sand Island which is in Baker's Bay?

A. Yes.

Q. You say that the wreck occurred in what year?

A. On the 19th day of April, 1879.

Q. I will ask you whether or not since that time the ocean-going vessels have used a course which took them north of that wreck?

A. Yes.

Q. Since that time?

A. Yes.

Q. What years?

A. From 1880 to 1886.

Q. Have vessels taken a course which took them north of the Republic wreck since 1886?

A. Since 1886, no,—not deep water vessels.

511 Q. All deep water vessels now and since 1886 have used a course which took them south of the Republic wreck?

A. Yes sir.

Redirect examination.

By Senator FULTON:

Q. Counsel for the State of Washington in cross examination asked you whether or not a deep sea vessel could be taken along the course indicated by the dark lines marked "Line claimed by State of Oregon." You answered no, or in words to that effect. I now ask you if you made that answer because the course was not generally correct, or simply because the line seemed to carry too far into Baker's Bay?

A. Well, that is the idea.

Q. You think the line there as indicated extends too far northerly into Baker's Bay?

A. Yes.

Q. A vessel even at the present time—a deep sea vessel, coming in south of Sand Island and going to Knappton would take approximately that course, wouldn't it, from off Chinook point?

A. Yes, up to Point Ellice.

Q. Now, vessels do regularly run in to Baker's Bay and north of Sand Island at the present time, do they not? I do not speak of sea going vessels, but river boats.

A. Oh yes, river boats.
Q. You know the steamer Potter, do you not.
A. Yes.
Q. What is she?
A. She is a side-wheel passenger steamer.
Q. The largest one that runs on the river is she not?
A. Yes.
Q. Between Portland and Ilwaco?
512 A. Yes.
Q. By Astoria?
A. By Astoria.
Q. Now, does not the Potter regularly run into Ilwaco north of Sand Island?
A. Yes sir.
Q. She goes there on the flood tides, does she?
A. Well, she goes there; I don't know. She goes there.
Q. You don't know how she works the tides?
A. No.
Q. Presumably, though, on the flood tides?
A. On the flood tides.
Q. Anyway, she regularly runs in there?
A. In the Summer time.
Q. In the summer time, yes, during the seaside tourist season?
A. Yes.
Q. There are various other river boats that regularly run in there, are there not?
A. The Nahcotta runs there every day.
Q. The year round?
A. Yes.
Q. What is the Nahcotta?
A. She is a propeller passenger boat.
Q. How many passengers does she carry, do you know?
A. I don't know. 75 or 100 I think.
Q. I am speaking about running into Ilwaco and going north of Sand Island?
A. Yes sir. The Guy Howard runs there too, you know.
Q. Now, at times these river boats that run into Ilwaco go south of Sand Island and between Sand Island and the Cape in
513 getting into Ilwaco, do they not?
A. Not now.
Q. They do not at the present time?
A. No.
Q. They have in former years.
A. Yes.
Q. You spoke awhile ago about the changes in the channels on the bar, sometimes occurring in a very short period of time, others being gradual. Now I ask you if, as a matter of fact, these channels do not reappear again in substantially the same places, frequently?
A. Yes sir.
Q. Disappear and appear in another place, and then reappear in the old line, substantially?

A. Yes sir.

Q. There is at the present time constructed and being extended from Fort Stevens seaward a government work, called a jetty, is there not?

A. Yes sir.

Q. Designed for the purpose of the improvement of the bar?

A. Yes sir.

Q. Or an entrance, rather, to the river?

A. Yes sir.

Q. Prior to the construction of that jetty was it not characteristic of the entrance of the river for the north Spit running out from Fort Stevens to build up and extend northwesterly and narrow the channel and give for awhile a deep channel, and then break away again and the mouth of the river widen and the channel shoal and then again the Spit would build up and narrow the channel and give for a while deeper water?

A. Yes.

514 Q. Wasn't that the course that continually took place there?

A. Yes sir.

Q. So that the old channels would disappear and then reappear again in course of time?

A. Yes sir.

Q. And substantially the changes were along the line I have indicated?

A. Yes.

Q. Of occurrence and recurrence?

A. Yes.

Q. Now, you spoke about Peacock Spit. That I understand—and ask you to ascertain whether or not I am correct in my understanding—is a sand spit extending out from Cape Disappointment seaward?

A. Yes sir.

Q. And I understand you to say that in your early experience on the bar you would have to go considerably north of Cape Disappointment in order to start in to the river?

A. No; just about due west.

Q. Start in about due west of Cape Disappointment?

A. Yes.

Q. And then you would come in between Peacock Spit, and what other point?

A. And Sand Island.

Q. That is, you would sail around the south point of Peacock Spit?

A. Yes.

Q. Or, rather, the southerly point?

A. Yes the southerly point, the southeast.

Q. The southeast point of Peacock Spit?

A. Yes.

Q. And thence around and near to Cape Disappointment?

515 A. Yes sir.

Q. And between that and Sand Island?

A. Yes.

Q. And then around Sand Island?

A. Yes, following the channel.

Q. In speaking of Sand Island, I have reference to the Sand Island, of course, as it existed during the time of your experience on the bar, and as I understand substantially as the northerly Sand Island marked on this map.

A. Yes, but it is the same Sand Island as it ever was.

Q. Yes, exactly. Now, I want to ask you about that. You say it was the same island?

A. Yes sir.

Q. As a matter of fact there has never been any disappearance of that island, has there?

A. No.

Q. Whatever changes have occurred there have been very gradual and imperceptible have they not, from day to day?

A. Except that in a heavy blow sometimes the island will split in two, and then it would be joined together again.

Q. In a heavy blow it sometimes washes a hole right through?

A. Yes.

Q. But I mean the same island has always continued there?

A. Yes sir.

Q. And always has been there, as far as you know?

A. As far as I know, yes.

Q. Now, as a matter of fact, have not whatever changes have occurred in Sand Island been a gradual and imperceptible building on and extension of the north part of the island into Baker's Bay, and gradual erosions or cutting away to some extent on the southerly part of the island?

516 A. Yes.

Mr. MACDONALD: I suggest to counsel that his questions are rather leading.

Senator FULTON: That is quite true, I have that fault, but I am trying to get along.

Mr. MACDONALD: This is a pretty intelligent witness.

Q. I will ask you, in view of what counsel suggests—and I admit that my questions were somewhat leading—to just tell us what has been the character of change in the form and location of Sand Island since you have known it?

A. The Island, as I first remember it, appeared in about a half-moon shape; then again it took on a pear shape; and then again it had been long and narrow, like a narrow streak of sand; and then it has filled up again in some places and got of an irregular form, jagged looking. So I believe that it was never the same for two years in form.

Q. What is the character of the surface of the island?

A. Sand.

Q. How is the surface of the island as it relates to the surface of the river at high tide, above or below?

A. It is considerably above high tide.

Q. Then, the surface of the island is above the water at all stages of the tide?

A. Yes, always some of it above.

Q. Are there any buildings or structures on it?

A. Yes there are a lot of buildings there, fishermen's buildings I don't know what they are used for. Fishermen live there some of the time, I presume.

Q. Those structures stand there the year round?

A. Yes.

Q. How long have you known of structures of some char-
517 acter being maintained on the island?

A. I couldn't tell, exactly.

Q. Ever since you have known it?

A. There have been buildings there since in the 80's.

Q. How is it about there being drift wood on it?

A. Oh, it is full and plenty there, lots of it; covered with logs.

Q. Counsel called your attention to the line marked "Channel Line 1905," and I understood you to answer that that was the general course taken by vessels coming in from the ocean at the present time. How far is that line from Tansy Point?

A. Oh, it would be, ¾ of a mile from Tansy Point.

Q. There is quite a wide channel there, is there not?

A. Yes, there is a spit in here at Tansy Point—a mud flat.

Recross-examination.

By Mr. MACDONALD:

Q. You referred to the steamer Potter. Can you tell us the draught or how much water she draws?

A. Not for sure, but I see her marked 8 feet.

Q. 8 feet?

A. I believe that is her draught.

Q. And do you know how much the Nahcotta draws?

A. 6 feet.

Q. 6 Feet?

A. Something like that.

Q. And I understood you to say it was your impression that these vessels went into Ilwaco at flood tide?

A. I suppose so.

Q. Don't you know, as a matter of fact, that it is impossible for either of those boats to go to Ilwaco at low tide?

A. I don't say in low tide.

Q. I know you didn't say in low tide, but isn't it a fact that it's impossible for them to go at low tide?

A. I don't know.

518 Q. You don't know as to that?

A. No.

Q. You have no personal knowledge, then, of the depth of this channel into Ilwaco?

A. No.

Q. Sand Island, since you first knew it, has moved north some two or three miles, has it not?
A. Well, a mile or two anyhow.
Q. And has grown very much larger than it was when you first knew it?
A. In one end of it.
Q. Well, isn't the island now very much larger than it was when you first knew it?
A. Yes sir.
Q. Two or three times as large, if not more, isn't it?
A. Well, I don't know; it is a pretty good size. I am not sure as to the dimensions exactly— the increased dimensions.

By Senator FULTON:

Q. You speak of the boats going into Ilwaco at high tide. I ask you if it is not a matter of fact that all the sea-going vessels going from Astoria to Portland have to work the tide as they call it, that is, go over the shoal places at high tide?
A. Not unless they are deep loaded.
Q. Well, when they are loaded.
A. From where?
Q. Going from Astoria.
A. To where?
Q. Up to Portland.
A. Oh, I don't know about that.
Q. You know it as a matter of common knowledge, don't you?
519 A. Well, I can't testify to something that I don't know anything about positively.

520 A. MONTGOMERY being duly sworn as a witness on behalf of the defendant, testified as follows:

Direct examination.

By Senator FULTON:

Q. Mr. Montgomery, will you state your age, residence and occupation.
A. Age 84; residence, Astoria; occupation, cooper by trade, but I have not worked at it for a good many years.
Q. How long have you resided in Astoria, Oregon?
A. I crossed the plains in 1852, and came to Astoria in the month of September, 1852. This has been my home pretty near all the time. I took a donation claim and my wife died and I had to leave it. This has been my home.
Q. The donation claim was in this county, wasn't it?
A. Yes, in this county. I have been in the county all the time. I went into the mines once.
Q. You were for some years an inspector of customs, attached to the customs house in this city, were you not?
A. Yes, in this state.
Q. How long did you occupy that position?

A. I was appointed in 1869 and went out in 1885, when Grover Cleveland was elected.

Q. Now, as inspector of customs did you have to do anything with ships and shipping on the river?

A. Yes, I got on to them and went on up, but I can't tell you anything about the channels, though.

Q. You know, though, the general courses that ships took?

A. They went up stream, yes.

Q. They came down also, did they not?

A. They came down, yes.

521 Q. I call your attention particularly to what is known as the north channel of the Columbia River as indicated on this map.

A. I couldn't tell you anything about the channels. Don't ask me that. I couldn't tell you anything about that.

Q. I am not going to ask you anything about the courses of the channels. You know where Knappton and Ellice Points are on the north shore of the Columbia River?

A. Well, I would like to tell you what I know, but I don't want to——

Q. All right; tell us all you know.

A. When I first came here, all the vessels said it was the north channel. They come in and come around in Baker's Bay; I have seen six or eight vessels in there at one time.

Q. Come in north of Sand Island?

A. Come in north of Sand Island, yes. And then when they came up they came up north of Sand Island up here, and for years all vessels went down into Baker's Bay, north of Sand Island, and laid there until they got ready to sail.

Q. What, if anything do you know about vessels going up on the channel along the north shore?

A. Well I have seen some vessels go up the north channel to Knappton to load lumber, and I have seen one or two vessels come down on the north side and go to Knappton. I have seen them from this side over there.

Q. These vessels of which you speak that came down the river and went to Knappton, did they come by way of Astoria, or go along the north side of the river?

A. The north side of the river.

Q. They didn't come to Astoria. About how wide is the river at Astoria?

A. Well, they say it is six miles. I never measured it.

522 Cross-examination.

By Mr. WELSH:

Q. What year was it, Mr. Montgomery, that you saw the vessels going on the north side of Sand Island?

A. It is since that saw mill has been built over there.

Q. Since the saw mill was built over there?

A. Yes.

Q. Do you know what year that saw mill was built at that place?
A. No, I could not tell you the year.
Q. It was at least 20 years ago.
A. Oh, yes sir; longer than that.
Q. More than that?
A. Yes.
Q. Probably 25 or 30?
A. 30 years ago, I guess.
Q. 30 years ago?
A. I think so; I wouldn't be certain.
Q. But for the last 15 years you have not seen any vessels going on the north side of Sand Island in going up the river, have you?
A. After I went out of the office I haven't been looking for vessels much.
Q. No; but for the last 15 years you know as a matter of fact that they have been unable to go on the North side of Sand Island, don't you?
A. I don't think the ships go up that way.
Q. And they have not gone up that way for about 15 years?
A. Not that I know of.
Q. You never were on any of the vessels that you saw go up there 30 years ago, were you?
A. While I was inspector vessels came in to Baker's Bay,
523 got stuck there, and I went down on either the pilot boat or the tug and went aboard of her. She had foreign goods aboard, and they hauled her off and she came up to Astoria here, and she come on the north side of Sand Island, come around the head of Sand Island up here.
Q. She went on the north side of Sand Island?
A. Yes.
Q. That was more than 20 years ago, was it?
A. Yes, it must have been 25 years ago.
Q. For the last 15 or 20 years all of the vessels that come from the ocean and all that go seaward travel on the south channel do they not?
A. As far as I know, yes.
Q. And the south channel, of course, is on the Oregon side of the river?
A. Yes.
Q. Mr. Montgomery, you know as a matter of fact, and as a matter of common knowledge that the north channel is impassable and cannot now be used for ocean-going vessels?
A. That is what I heard.
Q. And you have known that to be a fact for the last 15 or 20 years, have you not?
A. No; no large vessels went up that way.
Q. For the last 20 years?
A. Yes.
Q. Now, you used to know where Sand Island was 20 or 30 years ago, did you not?

A. Yes, it was there when I first came here.

Q. Yes, it was? Have you seen it recently or within the last 10 or 15 years?

A. Yes I was down there this last winter. It is there yet.

524 Q. Has or has not Sand Island built up?

A. Well, I couldn't tell you. I didn't pay particular attention to it. It was there.

Q. It was there?

A. Yes, it was there and covered with logs so far as I could see, and there appeared to be men on it fishing.

Q. Is it not a great deal farther north than it used to be? Has it not built up on the north side for about a mile or two?

A. I couldn't tell you as to that. I know that they used to go up and down on the north side and they don't now-a-days.

Mr. WELSH: Speaking with reference to Baker's Bay, I think you admit that is shoal anyway?

Senator FULTON: That Baker's Bay is shoal?

Mr. WELSH: Yes.

Senator FULTON: We admit it is too shoal for the deepest sea-going ships. Of course we do not admit that sea-going vessels of light draught could not go in there at high tide because they can.

Q. Do you know the condition of Baker's Bay now?

A. Oh, I don't know anything about it.

Q. You don't know anything about it now?

A. I heard when I first came here that a man by the name of Holman was going to build a townsite down where they come in around into Baker's Bay.

Mr. WELSH: I don't care anything about that.

Senator FULTON: Fort Canby, you mean?

WITNESS: Yes; around in Baker's Bay. A man by the name of Holman sent East and had a house shipped out here.

By Senator FULTON:

Q. Counsel for the State of Washington asked you in Cross examination if, as a matter of fact, the north channel is not

525 at the present time and has not been for the last 15 or 20 years impassable for deep sea going vessels, and you answered yes.

A. Been impassable?

Q. Practically so.

A. Well, I heard so; that is all I know.

Q. He used the words "the north channel."

A. Yes.

Q. What did you understand him to mean by that?

A. Well, coming into Astoria, coming in the north side of Sand Island.

Q. Exactly. You had no reference to the channel along up the north shore of the Columbia River?

A. Oh, no.

526 E. A. BEARD sworn as a witness on behalf of the defendant, testified as follows:

Direct examination.

By Attorney General CRAWFORD:

Q. Where do you reside?
A. Astoria.
Q. What is your age?
A. 49.
Q. How long have you resided in Astoria?
A. Since 1868.
Q. What is your business?
A. Steam-boating.
Q. How long have you been engaged in steam-boating?
A. I have had a license since 1881. I worked several years before that on sail boats, and also as deck hand.
Q. How long have you worked on boats?
A. Probably five or six years before I had a license.
Q. State on what portion of the river you have been mostly employed.
A. Principally from the mouth of the Columbia River to Ranier, half way to Portland.
Q. You may state whether during the time of your employment on the river you have been pretty familiar with the channels.
A. I have tried to be, yes sir.
Q. State whether you take any special pains to be familiar with the channels.
A. I always do. Whenever I am not acquainted I use the lead to find out the depth of the water.
Q. State what has been the general condition, during all of that time, of the channel along the Washington shore.
A. From where?
527 Q. From Cape Disappointment to Three Tree Point.
A. I can't give you the exact date, but my earliest recollection in going or coming from the Cape up the channel (that is Cape Disappointment), we run out from the Cape and just keep the officers' quarters or the flag-pole well open from the end of the Cape and run right up, I should judge, about four miles to the upper end of sand Island, close to the upper end, on the north side; then we hauled over about a southeast course to the lower end of Desdemona Sands or a little above what is now Fort Stevens; that is, I say somewhere near that course. We came that way at that time for Astoria.
Senator FULTON: That was not an answer to your question, was it?
Mr. CRAWFORD: No; it was partly.
Q. I say going up the river from Cape Disappointment, on the Washington side, how was the channel?
A. From Cape Disappointment?
Q. In going up the river on the Washington side.
A. You mean starting from the Cape?
Q. Yes.

A. We generally started out in about an easterly or east half south at that time, in those days (that is my first recollection) for somewhere about between three and four miles, I should judge, to the head of Sand Island, pretty close on the north side. Then we generally hauled out a little to clear what was called Chinook's Spit coming out from Scarbora Hill.

Q. Continue on up to Three Tree Point.

A. We followed pretty close then to Point Ellice. The
528 channel there is about half a mile wide. You mean following the shore?

Q. Up to Three Tree Point. That is the north channel.

A. In front of us there were two channels at that time.

Q. Describe them.

A. There were three channels at that time.

Q. At Point Ellice?

A. From Point Ellice to Tongue Point there were three distinct channels.

Q. Tell what they were?

A. There was what was called the north channel, what we called the blind channel, and what we called Tongue Point shoot.

Q. Before you go on I wish to ask you one more question. What you call the blind channel now, was that commonly and frequently called the middle channel?

A. Well, we would call it part of the middle channel.

Q. Part of the middle channel?

A. Yes.

Q. Describe from there on up to Three Tree Point.

A. From where?

Q. From Point Ellice up to Three Tree Point—those three channels.

A. The inside channel followed the Washington shore close to Knappton. In front of Knappton at that time there was a middle ground between the inside channel and one out a little from Knappton wharf. At that time I used to take the outside channel from there because it was the deepest, carried about fourteen or fifteen feet of water. Inside the channel was not quite so deep then.

Q. What you mean by outside channel there is the blind or partly middle channel?

A. No, it is really what I have started in to call the north channel. There are really four channels for a south channel.
529 This outside and inside comes in together there just a little above Knappton, the middle ground there. Then I go straight from there to Burnie's Point, just below Frankfort; and from there we go about east, or for Harrington's Point, nearly straight, until you get in Gray's Bay, I should judge about half way between Harrington's Point and Burnie's Point; it branches off then and there are two distinct channels, one going out toward the middle of the river and the other following closer to the Washington shore. The outside channel at that time was the deepest, the one that we traveled which is now practically closed, and the inside channel is the one that is traveled. From there on through to Har-

rington's Point they come in together, above; it is virtually one channel; comes into what is now the ship channel at Harrington's Point; they all come in together.

Q. And from there to Three Tree Point?

A. From there to Three Tree Point has always been a good channel, as far as I can remember, right along close to the Washington shore.

Q. What is the depth of that channel at the present time in the lowest place?

A. Which channel?

Q. The one that you traveled up, the inside channel or north channel; the inside channel from Knappton to Three Tree Point?

A. From Knappton to Burnie's Point we had from 12 to 14 feet as the shoalest; it is now less.

Senator FULTON: At low tide, of course?

WITNESS: Yes.

Q. About what is it now?

A. Well, that is, that channel I have reference to. The inside channel I haven't sounded for a long time; it may possibly
530 have opened inside, but the channel I traveled at that time that had 12 and 14 feet is shoaled, there isn't as much.

Q. Have you been up there lately, and sounded through?

A. I haven't sounded through lately. We travel now inside, just around Knappton, and take the inside channel; I haven't sounded that.

Q. How as to that inside channel?

A. Well, I think there is just as much water as ever.

Senator FULTON: At the present time?

WITNESS: Yes. But the channel that I used to travel altogether is shoaled up considerably; from Burnie's Point to Harrington's Point we found from 3 to 4 fathoms of water until we got about half way to Harrington's Point, and from there in some places 5 and 6 fathoms.

Mr. MACDONALD: May I interrupt to ask the witness where Burnie's Point is?

WITNESS: Burnie's Point is the first point above Knappton.

Senator FULTON: Between Knappton and Gray's Bay.

WITNESS: Yes.

Mr. MACDONALD: Is it what is known as Portuguese Point?

WITNESS: I believe it is the same thing.

Q. Now, then, you may state whether that has been a well-defined channel during all these years through there?

A. As long as I can remember there have been all those distinct channels I speak of.

Q. And there are at the present time?

A. Yes.

Q. You may state where the middle channel is.

A From Point Ellice, you have reference to, up?

Q. Yes. From where they go by there.

A. From Point Ellice to Tongue Point,—what we call
531 Tongue Point shoot, opened somewhere about 1878 or 1882 or 1883, as near as I can understand; in fact it was open as

far as I can remember, but it seems there hadn't really been a channel through there, they claim, very long. That is, as near as I can remember there was a good channel from Point Ellice to Tongue Point, what is called the Tongue Point shoot; the fishermen all use it. And the other channel I have reference to, that I call sort of a middle channel, went up to probably three miles outside of Knappton from Point Ellice, and then it went to the northward of what is known as those high middle sands and came in to Burnie's Point, again, pretty close.

Senator FULTON: Connecting with the channel you have been describing?

WITNESS: Yes; but I never knew of any other middle channel.

Q. How long ago is that?

A. That is as late back as 1880, positively, and I couldn't say how much longer, but I can remember that far back very distinctly. Before that I was simply renting sail boats.

Q. Then, if I understand your testimony correctly, this north channel that ran along there divided up near Point Ellice and then went on, and after a while it came in together again?

A. You mean the north channel?

Q. Yes.

A. Is that what you have reference to?—the north channel divided or what?

Q. Well, to get the middle channel that you just described.

A. Of course there is also another channel that I haven't mentioned. You asked me to give you the channel along the Washington shore. But there always was a channel, as long as I can remember, north of the Desdemona Sands that went through and connected with the channel abreast of Tongue Point. The chart
532 I believe does not show that in 1858.

Q. You know the channel there from about 1880, then?

A. Yes sir.

Q. And you know nothing about anything in there before that?

A. Nothing previous, no.

Q. And where did you say that ran?

A. Connected with the ship channel off of Tongue Point.

Q. With the Tongue Point shoot?

A. Well, it came into the Tongue Point shoot also, yes sir.

Q. It ran into that?

A. Yes. The Tongue Point shoot and what we call the middle channel north of Desdemona Sands came in together about abreast of where the quarantine station now is, or I might say McGregor's Mill; well out in the middle of the river they came together and the deep water continued on up to Tongue Point.

Q. Look at Oregon's Exhibit No. 9, and at Point Ellice thereon and tell me if immediately in front of Point Ellice is what you consider the north channel or what?

A. The north channel I would call this channel following the Washington shore.

Q. Then, this middle channel is the one that branched off just

above Point Ellice where it says 6 fathoms, 4¾ fathoms and 6¼ fathoms to the edge of the map?

A. The middle channel is here north of the Desdemona Sands. (pointing on map).

Q. That is what you would call the middle channel?

A. Yes sir, right up here. Tongue Point shoot connects with that right in here. There is also another channel running around abreast of Knappton; that is up in here. Up in here in Knappton, I believe. There are docks built there.

Q. What you call the middle channel since 1880, since
533 you knew it is the channel which is on the north side of Desdemona Sands?

Q. You may state whether the south channel as you knew it at that time was a channel running on the south side of Desdemona Sands?

A. Yes sir, the south channel, the same as it is now there. (Pointing on map.)

Q. Then the three main channels——

A. There were really only two main channels.

Q. What were they?

A. The north and the south.

Q. You may state whether or no the middle channel then was considered as one of the main channels?

A. No sir, it was not. Light draught vessels used it; probably deeper ones could if necessary,—from three to four or five fathoms.

Cross examination.

By Mr. MACDONALD:

Q. You testified at considerable length concerning these channels and the use of them by yourself and others. To what time do you have reference?

A. To my time.

Q. What years were those?

A. I should say probably from 1878 up to the present time.

Q. Are you actively engaged in navigation on the river?

A. Yes sir, all the time.

Q. Which way do you go—up or down?

A. Now I am both ways, that is, on the Columbia River inside.

Q. Are you a pilot?

A. No sir; only on the river here.

Q. You are a river pilot?

A. No, I am just master of a little boat here, a steamer.

534 Q. Master of a steamer?

A. Yes.

Q. Have you ever taken the pilot examination here?

A. No, not as a pilot; only as master and pilot of a steam vessel.

Q. Will you step over to this map, please, so you can see it? I understood you, did I, that in coming in from the ocean the course from Cape Disappointment passed along towards the north of Sand Island as shown on Oregon's Exhibit No. 9?

A. No sir, I never said anything about coming in from sea.

—. Well, I wish you would give me the course from Cape Disappointment.

A. The course from Cape Disappointment, at that time, the way we ran at that time (and I have noticed others) was about an easterly course or an east half south, (I suppose there is a difference in compasses; I only go by my boat's compass) to three or four miles, I should judge it was, to the upper end of Sand Island, coming close to it.

Q. That is, as shown on Oregon's Exhibit No. 9?

A. Well, I don't know anything about what this is.

Q. This is the map here.

A. During the time I was running there that is the way I ran.

Q. That course would take you, would it not, to a point just north of Sand Island as shown on this map, Oregon's Exhibit No. 9.

A. Yes sir. I understand you now.

Q. And your course from there, I understood, was up towards Chinook Point?

A. Following the Washington shore, we headed out a little to get outside of what was called the Chinook Spit; we generally
535 hauled out a little and shaped our course for Point Ellice.

Q. Came right around to Point Ellice. I will ask you whether or not the course which you have just indicated was the one usually pursued by sea-going steamers in going to Astoria and Portland at that time?

A. It was buoyed out and steamers and sailing vessels were going that way.

Q. Is that the course they customarily followed?

A. They came in both ways.

Q. Is it not a fact that the course generally and usually followed at that time by the ocean going steamers coming from the sea to Portland and Astoria took them by Cape Disappointment north of Sand Island as shown on Oregon's Exhibit No. 9 and then down towards Point Adams, past Tansy Point up to Astoria?

A. Well, I have not testified anything in regard to that.

Q. I am asking you now.

A. But we came over in the neighborhood of Fort Stevens or Tansy Point from Sand Island—not to Point Adams over into just clear the lower end of Desdemona Sands. We had a range we always went by in coming down. Generally when we got to Fort Stevens we would head off for the Wallacutt River until we found the head of Sand Island. Heading for the mouth of Wallacutt River is the way we used to run in the early days.

Q. Am I correct in saying that vessels going from the sea to Astoria and Portland went south of the Desdemona Sands?

A. They did to go to Astoria, yes.

Q. And that was the route pursued by practically all of the ocean-going steamers?

A. Yes sir, they had to come here to the custom house.

Q. And none of the ocean-going steamers in going to Port-
536 land took this northerly course which carried them close to Chinook Point and Point Ellice and along the Washington shore?

A. I never knew any to go that way in going to Portland.

Q. And they do not at the present time pursue that course in going to Portland?

A. No, they come around the buoy channel.

Q. In going to Portland the vessels take the channel close by Astoria and up to Tongue Point, do they not?

A. Yes sir.

Q. And then up the river from there on?

A. Yes.

Q. In your experience on the river have you ever known of vessels going to Portland—vessels and steamers—following the channel along the bank of Washington?

A. We always go that way.

Q. I mean ocean-going steamers?

A. Not steamers, no; I don't know of any. But there have been one or two of Simpson's vessels gone up through that way in tow.

Q. Schooners?

A. Schooners, yes.

Q. I desire to confine my question to the usual course pursued by passenger steamers and freighters coming from the ocean up to Portland. They all pursue this southern channel which carries them past Astoria and past Tongue Point, on?

A. Yes sir.

Q. The channel from Tongue Point to Three Tree Point for a number of years ran through Woody Island channel, did it not?

A. Yes sir.

Q. And for a short time through Cordell channel?

A. I don't know anything about this Cordell channel. Oh, yes, the Cordell channel is the one I do know about, coming out of Snag Island. They had just abandoned this other way and came around this other way. (Indicating.)

537 Q. Went through Cordell channel, from Tongue Point to Three Tree Point?

A. Yes.

Q. Are you familiar with this channel at the present time, north of Sand Island?

A. Yes, pretty familiar with it.

Mr. CRAWFORD: There won't be any dispute about that. We admit that is not navigable at all. The State of Oregon admits that the channel north of Sand Island, between Sand Island and Cape Disappointment, is now not navigable except for vessels of light draught. It is not navigable for the usual sea-going vessels. I am speaking of low tide.

Q. I wish you would just look at the map here. Do you know the depth of the channel between Fort Canby and the nearest point of Sand Island?

A. No, I don't believe I do at present.

Q. Do you know whether it is possible at low water for any vessels, any steamers, to pass through there?

A. Going to sea?

Q. Yes.

A. The steamer "Melville" went across at the lower end of Sand Island with the cable that broke.

Q. Was that at high or low water?

A. High tide. It is not navigable. We wouldn't call it navigable. Of course -he got through.

Q. It would not be possible for a passenger steamer to pass through this channel between Canby and Sand Island at low water, would it?

A. No sir.

538 By Senator FULTON:

Q. Isn't it a fact that the reason why deep sea vessels, as a rule, as you have testified, come up the south channel to Astoria and thence to Portland is because of the fact that the custom house is located here, and the further fact that this is the only port where they can provision after coming in from sea until they get to Portland?

A. Yes sir, with the addition that this channel is kept open.

Q. This is kept open how?

A. By dredging.

Q. The other could be kept open just as well and made just as good a channel by an equal amount of dredging?

A. I think it could yes, sir, every bit.

Q. But most vessels desire to get some supplies when they come in the river, do they not?

A. Yes sir; that seems to be the way they want to come.

Q. And, besides, the custom house is located here?

A. I suppose they have to, the way it is.

By Mr. MACDONALD:

Q. Under the present existing conditions, the fact that this channel is now open as you say, this lower channel which is used by the boats at the present time is the better one now?

A. Which lower channel?

Q. The south channel, up close to Astoria and Tongue Point.

A. Oh, I don't say it is any better.

Q. Well, it is the one that the navigators under all the conditions as they exist now, would take?

A. Oh, you mean being a better channel than the north channel?

Q. Yes.

A. Yes sir, it is.

539 By Senator FULTON:

Q. By reason of its being kept open, as you answered, by the dredging?

A. Yes sir, by the dredging.

The hearing thereupon was adjourned until July 16, 1906, at Hotel Breakers, Pacific County, Washington, at which place testimony was taken on behalf of the complainant; whereupon an adjournment was taken until July 24, 1906, at Hotel Portland, Portland, Oregon, when further testimony on behalf of the defendant was taken as the same is set forth in the pages following:

540 *Testimony Taken at Hotel Portland, Portland, Oregon, July 24, 1906, on Behalf of the State of Oregon.*

Capt. GEORGE WARREN WOOD, being duly sworn as a witness on behalf of the State of Oregon, testified as follows:

Direct examination.

By Senator FULTON:

Q. Captain, state your residence, age and occupation.

A. My residence is Astoria, Oregon; I am 62 years old; my occupation is a bar pilot on the Columbia River.

Q. How long have you been following the pursuit of a Columbia River bar pilot?

A. About 25 years.

Q. How long have you been acquainted with the Columbia River and the mouth thereof?

A. 39 years.

Q. In what business or occupation were you engaged prior to becoming a bar pilot?

A. I was a lieutenant in the Coast Survey of 1867 and 1868; we made the survey of the Columbia River bar at that time.

Q. How long were you in the Coast Survey in the employ of the Government?

A. About 7 years.

Q. You assisted in making a survey of the mouth of the Columbia River, you say?

A. Yes sir.

Q. In what year was the earliest survey you made?

A. 1867 and 1868; that is the hydrographic survey.

Q. I call your attention to Oregon's Exhibit 9, and ask you to state whether or not that is a map made pursuant to the survey you say you assisted in making.

A. Yes, that is the map.

541 Q. At the time you made that survey, where was the north channel of the Columbia River, with reference to Sand Island?

A. It went on the north side of Sand Island, between Sand Island and Cape Disappointment.

Q. How would ships enter the mouth of the Columbia River in order to sail through and up the north channel at that time?

A. (Pointing on map.) They would enter on the course something north of east and then haul up straight for the Cape. The channel was crooked. You came in steering to the eastward and then hauled up to the northward more, around into Baker's Bay.

Q. And would run close, you say——

A. Close to Cape Disappointment, a very short distance; just half way between the Cape and the east end. You could take a ship through there and she would have plenty of room. The soundings were bold right up and down—deep water.

Q. What was the course at that time in bringing your vessel in, passing Cape Disappointment? Would you round the Cape?

A. You could round the Cape and come into Baker's Bay and anchor, or you could keep on and go around Sand Island out here to Astoria.

Q. I would like to have you describe as nearly as you can, the course of a vessel coming in the north channel by Cape Disappointment and north of Sand Island at that time, in such language as can be entered in the record, so as to identify the course.

A. You know the compasses on a vessel change; there are local attractions and you can't depend on a compass. You must have ranges of shore that you can steer by; you must have land-marks to verify the compass courses. Now, one mark particularly that we had coming in here was after we hauled up to the Cape and had passed the Cape going up towards Sand Island.

542 Q. Would that be still on a northerly course or an easterly course then?

A. The northerly course would come up to Cape Disappointment, and then as a stern range you always keep the Disappointment light-house tangent to the east side of the Cape coming up this way. It cleared the spit that they call Sulphur Spit here, and kept it clear of Chinook Spit over there. That range defined the northern limit of Sand Island water that you could cross to deep water. You couldn't come south of that line.

Q. I will ask you to indicate in a general way by marking in red ink the course of a vessel at that period entering the north channel from the ocean, rounding the Cape and Sand Island that you have described. (Referring to Oregon's Exhibit No. 9.) Such a course would leave Sand Island to the south of the track of the vessel?

A. Yes sir.

Q. How many channels at the mouth of the river were there in 1868?

A. Two.

Q. By what names were they known?

A. North and south channels?

Q. What was the general course of the north channel after getting inside of the river?

A. Well, they came together at the head of Sand Island. After you came out around the head of Sand Island you would join the south channel. The north and south channels came together.

Q. They came together?

A. Yes.

Q. Then, from there on, what channels were there?

543 A. There were three channels then.

Q. There were three channels?

A. Yes sir.

Q. Now just describe each of those three channels, beginning first with the north channel.

A. The north channel went around by Chinook Point and around Point Ellice, up to Cementville—they called it then—now Knappton.

Q. Did these three channels proceed out of what we will call the junction of the north and south channels at the head of Sand Island from the ocean?

A. From the ocean, yes.

Q. Proceed.

A. Then there was a channel that went from Point Ellice to Tongue Point—the middle channel.

Q. Describe that middle channel fully. Describe it first on sheet 1, Oregon's Exhibit No. 9, to the easterly end of that exhibit.

The witness points on the map.

Q. Mark on Oregon's Exhibit No. 9 in red ink the middle channel from its initial point to the end of that exhibit.

The witness marked as requested, and said: These come together here.

Q. Have you marked them so it is shown how they go?

A. Yes.

Q. Trace the south channel as well.

The witness does as requested

Senator FULTON: The witness has traced on the plat, Oregon's Exhibit No. 9, in red ink, certain lines leading out from what he has described to be the conjunction of the north and south channel entering from the ocean at the head of Sand Island, one line
544 leading up along the Washington shore. What does that indicate?

WITNESS: That is the north channel abreast of Point Ellice.

Q. I will ask you to mark that north channel.

The witness marks as requested in red ink.

Q. Branching from the channel you have described and designated as the north channel just south of Point Ellice, you have indicated a channel extending——

A. The general direction of it would be towards Tongue Point.

Q. What is that line to indicate?

A. It indicates water there that could be used, of course,—a channel.

Q. Will you designate that as a branch of the north channel?

A. As a branch of the north channel, yes sir. It was used by small boats going across there back and forth.

Senator FULTON: I will ask that that be marked the branch of the north channel. Let the record show that the witness so marks it in red ink.

Q. Opening out from the junction of the north and south channels entering from the ocean, at the head of Sand Island or a short distance easterly therefrom, is another line indicated by you in red

ink, to which I now call your attention, and ask you what channel of the river that indicates.

A. We call that the middle channel.

Q. I will ask you to mark that in red ink "Middle Channel".

The witness marks as requested.

Q. Now, I will call your attention to Oregon's Exhibit No. 7, and ask you if that is a continuation up the river of Oregon's Exhibit No. 9?

545 A. Yes sir, this is a continuation.

Q. Will you kindly indicate by red lines the continuation of the channels you have marked on Oregon's Exhibit No. 9?

A. They all come together here abreast of Astoria,—right here. (Pointing on map.) Here is Tongue Point. From Tongue Point to Point Ellice practically this channel comes in here. This middle channel comes up here and the south channel comes up in here. They all focus right here.

Q. I understand, then, from your statement that the channel marked on Oregon's Exhibit No. 9 as "Branch of North Channel" and the channel marked "Middle channel" form a junction or come together in one channel at a point slightly west of Tongue Point. I ask you to mark on Oregon's Exhibit No. 9 an "X" in red ink, the point of junction of the branch of the north channel and the middle channel.

The witness marks as requested.

Q. From that point I will ask you to indicate, by drawing a red line, the continuation of the channel formed by the junction of these two as it was at that time.

The witness marks as requested.

Q. Now, you have marked a channel following the words "Woody Island Channel" and also the channel marked "Cordell Channel." I ask you if there was a channel also leading from a point near Yellow Bluffs down to opposite Tongue Point?

A. There had been a channel there formerly, but it had been closed up; at that time it was not used.

Q. What was the cause of the closing up of that channel?

A. The wreck of a vessel. A brig was wrecked in there some place; I could not indicate exactly where it was.

Q. Indicate the general course of that channel which you say had formerly been used but was closed from the channel north of Tongue Point.

546 A. Somewhere in this vicinity. (Indicating on map.)

Q. I ask you to identify that channel by marking it "Continuation of middle channel."

Witness marks as requested.

Q. Now, you have indicated on Oregon's Exhibit 9 the north channel to a point east of Knappton. I ask you to continue that channel, or, rather, continue a line on Oregon's Exhibit No. 7, in-

dicating that channel up to Yellow Bluffs or up in the vicinity of Yellow Bluffs.

Witness marks as requested.

Q. I wish you would now look at Oregon's Exhibit No. 9, and indicate by a line in red ink thereon the south channel at the entrance of the Columbia River up to the point where you say the two channels form a junction.

Witness marks as requested.

Q. Again calling your attention to Oregon's Exhibit 7 and the line you have marked there as a continuation of the north channel, I ask you to indicate it by the words "North channel" in red ink.

Witness marks as requested.

Q. Now, from the point where the middle channel and the north channel form a junction near Yellow Bluffs to Three Tree Point, do they continue as one channel and did they at that time?

A. They come together at Woody Island and then continue as one channel to Three Tree Point.

Q. They come together between Woody Island and Jim Crow Point?

A. Yes sir, that is where they come together.

Q. What channels do you say come together there?

A. The Woody Island channel, the Cordell channel and the north channel.

547 Q. But the question I asked you is where this channel marked "Continuation of Middle Channel" joins the north channel at a point near Yellow Bluffs and southerly therefrom. Do those two channels now and did they then continue as one channel from there on to Three Tree Point?

A. Yes sir.

Q. At the time this survey of 1868 was made, do you know whether or not the north channel and that portion thereof from its junction with the middle channel at Yellow Bluffs westerly to Knappton, was being used as a channel of commerce?

A. Yes sir.

Q. Just describe what you know about that.

A. It was used by the vessels of the Simpson Lumber Company. They loaded a general cargo and came to Portland.

Q. Loaded where?

A. They loaded in San Francisco and brought their freight up to Portland; and then going down the river, instead of taking that Woody Island channel, they would take the north channel along the north bank and go to Knappton to load lumber and go from there out to sea. They would follow the north shore and come down here and go to Knappton.

Q. By which I understand you to mean, as you have indicated on the map, that the vessels would come down the north channel to the point of junction between the continuation of the middle channel and the north channel, as marked by you on the map?

A. Yes sir.

Q. And then from that point of junction follow the north channel to Knappton?

A. Yes sir.

Q. How much water was there in that channel at low tide?

548 A. I suppose about ten feet.

Q. What was the rise of the tide there?

A. Seven feet is the maximum rise.

Q. The average, you mean?

A. The average, yes; sometimes we would have more tide.

Q. But that was the average rise?

A. That was the average rise.

Q. Now, these vessels which you describe as pursuing that course, were sea-going vessels, were they?

A. They were sea-going vessels.

Q. Sailing between Portland, Oregon, and San Francisco?

A. Between Portland, Oregon, and San Francisco; vessels that would carry six or seven hundred thousand feet of lumber.

Q. You have stated, Captain, that the channel marked on Oregon's Exhibit No. 7 by you, as continuation of the middle channel, was not in use at the time this survey of 1868 was made.

A. No sir, it was not.

Q. It had been closed up, I understand you to say?

A. Yes sir.

Q. Am I correct in my understanding that you stated there had been a vessel sunk in that channel?

A. Yes sir.

Q. What was the effect of that?

A. It created a shoal there and closed the channel.

Q. Describe the usual course taken by ships at the present time in going from Portland to the sea, and from the sea to Portland, as regards that portion of the river represented on Oregon's Exhibit No. 7 from Three Tree Point down.

A. From Three Tree Point down they follow the north shore down to Yellow Bluffs and then across to Tongue Point—practically the old channel.

Q. Or, what is marked here "Continuation of Middle Channel"

A. Yes sir. Instead of going up this Woody Island chan-

549 nel, they go straight across.

Q. And they do to this day?

A. Yes sir.

Q. How long have they been following the old channel or what is marked there as "continuation of middle channel"?

A. I don't remember; I couldn't say how long. It is a good many years since that chart was made. It was a long time after that before they commenced to run that north channel.

Q. I didn't understand you.

A. I couldn't tell you the exact date they commenced to use that, because I never impressed my mind with it.

Q. Well, about?

A. Oh, I suppose ten or twelve years, somewhere along there; quite a long while.

Q. How has that channel been kept open?
A. It has been kept open by dredging.
Q. Are you a civil engineer, Captain Wood?
A. I used to be, yes sir.
Q. You may state what education you have had in the profession of civil engineering.
A. I had about 7 years' experience in the coast Survey, in hydrographic parties, and I was in the topographical party with Captain Rockwell.
Q. You were lieutenant, you say?
A. I was sailing-master with him.
Q. You have studied civil engineering?
A. Yes sir.

Mr. MACDONALD: We will admit that the Captain is qualified.

Q. I wish you would state whether, in your judgment, it would require more or less dredging to make the north channel by
550 way of Knappton to Three Tree Point equally as good a channel for commerce as the channel now generally followed by ships.
A. Well, that is a question that has never been asked me before, Senator, but I should say hastily that I should think it would be better, because the channels that are now used are across the current, and a channel that can be dredged with the current, in my judgment, at the moment, would be a great deal easier and more permanent than a channel dredged across, as we have samples of them there abreast of Astoria and all of them. I should think a dredge operated with the current would make a channel that would be more permanent and kept open a great deal easier than a cross one. I should say that on general terms—not because I am an authority, but that is my opinion.
Q. In your judgment, then, as I understand you, the north channel indicated in my previous question could be kept open at least equally as well?
A. Equally as well, yes sir.
Q. And with no more dredging?
A. Yes sir, with no more dredging, sure, and I should say less.
Q. Where has the Customs house been located since you have been acquainted with the Columbia River?
A. At Astoria.
Q. That is, the Custom house on the Columbia River?
A. Yes sir.
Q. That has been the only point where ships could enter and clear, has it not?
A. Yes sir.
Q. On the north side or on the Washington side there is no port of entry?
A. No sir.
551 Q. And no considerable settlement west of Three Tree Point, is there, on the Washington side?
A. No; scattering canneries, that is all.

Q. Nothing to invite commerce?

A. No sir.

Q. Now, this channel that you have marked "Middle channel" on Oregon's Exhibit No. 9, what character of channel was it in 1868 and what character of channel is it at the present day?

A. It is a channel that is only used by small vessels. There was no occasion to use it, consequently it was not used.

Mr. MACDONALD: Which channel are you referring to?

WITNESS:

A. To the middle channel.

Q. And is it a well-defined channel?

A. It is not marked by buoys, no sir, but it is well-defined, certainly.

Q. Would it be a difficult or expensive matter to keep that open for deep sea ships by dredging?

A. No sir.

Q. Would any more dredging be required to keep that open than is required to keep the south channel open at the present time between Portland and Astoria?

A. I think not, no sir. There is only one place where there would have to be any dredging, and that is over at the end of Taylor's Sands.

Q. At the end of Taylor's Sands?

A. Yes sir.

Q. That is the sand just practically north of Tongue Point?

A. Yes sir.

552 Q. At the head of this channel?

A. Yes sir.

(Recess until 2 o'clock p. m.)

Q. Captain, since you have been acquainted with the conditions at the mouth of the Columbia River, have the channels at the entrance always been as indicated on Oregon's Exhibit No. 9?

A. No sir.

Q. Describe the principal changes and variations that have occurred.

A. This south channel has gradually worked around to the north, and at one time the two channels (the north and south channels) came together at the lower end of Sand Island, somewhere about here. (Pointing on map.) So you could come in from the north and sail into the south and go out to sea without coming up to Sand Island at all; in fact, it has been done. Vessels have come in here and sailed right out that way and not come into the mouth of the river at all.

Q. Come in along the line where the south channel is marked?

A. Yes; probably a little outside of where it is marked there.

Q. And sail in how far?

A. Sail right in here.

Q. The reporter can put down "Right in here," but that doesn't indicate much in the record. Kindly indicate the points on this

map to which you refer, the courses, etc., by objects that are indicated on the map.

A. I should say a vessel would come right in here and probably head for Cape Disappointment.

Q. What do you mean by "come in here"?

A. I mean come in here, in the south channel, abreast of
553 Point Adams light, and go up in this direction.

Q. Following practically the line marked here?

A. Yes, and then go this way. (Indicating.)

Q. It would follow the line marked "South Channel" where it appears first out in the ocean, on this plat?

A. Yes sir.

Q. And sail along that line practically up to the word "Sands"?

A. Yes, and "breakers."

Q. And "Breakers"?

A. Yes sir.

Q. And thence off, leaving Cape Disappointment to the right?

A. To the right.

Q. And go on up the coast?

A. Yes sir.

Q. When did that condition obtain?

A. Well, I couldn't tell the exact year, but the later charts that were published will show that.

Q. Within your memory or personal recollection?

A. Yes sir.

Q. Now describe what different conditions, if any, have obtained in the matter of the north channel and the approach thereto from the ocean.

A. As late as 1900 and 1901 that was our principal channel, and it went out in this direction, and we never got to sea until we got up here abreast of North Head, away up there.

Q. In making this answer, you placed your finger on the plat at the end of the lines that are a note "Abbreviations of Bottoms," just west of North Head?

A. Yes sir.

Q. The entrance would be from that direction?

A. Yes sir.

Q. And sailing then in around——

A. Not there, no; there. (Pointing.)

554 Q. Down to just east of the word "North" on the North channel?

A. Yes sir.

Q. And thence in?

A. Yes sir.

Q. That, you say, was as late as 1901?

A. Yes sir.

Q. Is there any particular instance that you remember when you went over that course?

A. Yes sir.

Q. Kindly relate it.

A. I have a letter that the captain of the ship "Glenterret" an

English steam-ship—got through there, drawing practically 26 feet. That is about the heaviest draught that ever crossed Columbia River bar.

Q. Did you take the ship out as a pilot?

A. Yes sir.

Q. What year was that?

A. 1901. I have the letter from the captain.

Q. That is what impressed it on your mind?

A. Yes sir.

Q. And the ship was drawing what depth of water?

A. About 26 feet of water.

Q. Is that about as deep draught ship as ever went over the bar?

A. Yes sir.

Q. And that went out the course you have indicated?

A. Yes sir.

Q. Out opposite North Head?

A. Yes sir.

Examined by Att'y Gen'l CRAWFORD:

Q. I understood you to say, Captain, there was a channel north of Sand Island in 1868?

555 A. Yes sir.

Q. A good ship channel?

A. Yes sir.

Q. Used by ocean-going vessels?

A. Yes sir.

Q. Up to how late a date was that channel used by ocean-going vessels?

A. I couldn't say positively how late it was.

Q. About when—approximately?

A. I would have to look at the chart to tell.

Q. Can you recollect whether is was used in the eighties?

A. I don't think so. I don't think it was used practically in the eighties; probably in the seventies some time.

Q. Was it used for some years after you came on the river?

A. Yes sir. Vessels have anchored in Baker's Bay and then lightered from Astoria.

Q. And that is the channel, is it, to which you have testified, extending up along the Washington shore?

A. Yes sir.

Q. Do you know where Sand Island was in 1868 and where it is now?

A. Yes sir.

Q. You may state what was in 1868 the first island in the Columbia River going up the river above Sand Island.

A. Snag Island.

Q. And what was the next island, if you recollect?

A. Then Woody Island; and then there were a lot of other grass islands farther south, lying between what we call the channel and the Prairie Channel; there was a Prairie Channel that ran up inside

through a labyrinth of islands. Some of the- had names and some of them hadn't any names at all, and we designated them
556 and gave them names when we made the survey. They were simply marsh islands covered with grass, they had no names, and we designated them and gave them names.

Q. Snag Island and Woody Island are designated on the map?

A. Yes sir, they are designated on the map. Then there were a whole lot of other islands farther south; and then there was the big slough that they call Blind Slough that went in; there were innumerable islands, almost, up in through there.

Q. In referring to islands, do you mean land which is bare at high tide or a portion of it bare at high tide?

A. A portion of it bare at high tide, covered with a kind of growth of grass and bushes; no heavy timber, except on Woody Island; there is heavy timber on there, but on the others there was a scrub growth.

Q. You may state whether between Woody Island and the Washington shore there, were any islands or are now any islands there?

A. Not between Woody Island and the Washington shore.

Q. You may state whether Woody Island is the first island above Sand Island which is never entirely covered even at extraordinary high tides.

A. I think so.

Senator FULTON: You mean at that time?

Attorney General CRAWFORD: Yes, and along in 1868 and 1870.

WITNESS: Yes, there is a slough makes in there on the south side of this Woody Island. They called it at that time Brown's Slough. I don't know whether it is laid out that way on the chart or not. That went through to Cathlamet Head.

Q. You may state now whether Desdemona Sands has built up so that a portion now is bare at ordinary high tide.

A. They have.

Q. You may state whether south of Woody Island there are
557 other islands which are bare at ordinary high tide.

A. All of the islands, all these islands down here. Just above Tongue Point is one.

Mr. ALLEN: That is called Gray's Island, that first one, is it not?

WITNESS: Yes.

Q. You may mark with a pencil the islands which were bare, south of Woody Island channel, in 1868 and 1870.

Witness marks on Oregon's Exhibit No. 7 as requested.

Q. You may state whether all of those islands or pieces of land indicated on the map with heavy borders were islands.

A. They were islands, considerable islands.

Q. And above ordinary high tide?

A. Yes sir.

Q. You may state whether those islands are still there as they were in 1867 and 1868, or substantially the same.

A. Substantially the same.

Q. You may state how many channels there are at the mouth of the Columbia River to the sea at the present time—ship channels.

A. Well, you can hardly say that there is any channel there now. There are two ways we go out—one direct to sea and one south, and practically the same water in both channels. The channel that is buoyed and supposed to be the main channel goes directly out to sea, right to the westerly.

Q. You may state whether there is a north channel still in existence for small craft.

A. No; no, there is no north channel in existence now.

Q. The channel north of Sand Island, then, as far as being used for shipping purposes, is substantialy closed?

A. Yes sir.

Q. Is that your testimony?

A. Yes sir.

558 Q. And they now go south of it?

A. Yes sir. There are light draught steamers that go around to the north of Sand Island yet.

Q. What do you consider to be the north channel at the present time?

Senator FULTON: Where do you mean?

Attorney General CRAWFORD: At the mouth of the bar.

A. I consider the channel that goes out to sea as the north channel; it is north of the one that runs south, but that channel is really east and west.

Q. You may state whether that is the channel that runs in just south of Sand Island.

A. It does, yes sir, just south of Sand Island.

Cross-examination.

By Mr. MACDONALD:

Q. I will ask you to examine Washington's Exhibit H and tell us if the black line marked thereon and named "1905 channel line" does not indicate correctly the present ship channel used by ocean-going steamers and vessels in coming into the river and going out.

A. The present channel?

Q. Yes.

A. Yes sir, it is.

Q. And the only channel in use during the year 1905?

A. Yes.

Q. And that channel was in use in the month of November, 1905, was it not?

A. Yes sir.

Q. And that line correctly shows the channel over that portion of the river which is depicted in Washington's Exhibit H clear up beyond Astoria?

A. Yes sir.

Q. I will ask you whether or not you are familiar with the hydrographic conditions of the river in 1851 and 1854 by

559 perusal or examination of the charts and maps.

A. I have seen those charts and maps, yes sir.

Q. Have you examined the maps and charts of the hydrography of 1851 and 1852 so that you are familiar with them?
A. I have seen them; I have not examined them closely.
Q. You understand that at that time there were two channels—a north channel and a south channel——
A. Yes.
Q. — coming from the ocean into the Columbia River?
A. Yes.
Q. And that the southern channel was as shown upon Washington's Exhibit H, marked "south channel line 1854"?
A. Yes sir.
Q. And that the north channel is shown by the red line on Washington's Exhibit H, marked "north channel line 1854"?
A. Yes.
Senator FULTON: Are you asking if that is a fact?
Mr. MACDONALD: Yes; I ask him if he knows.
Senator FULTON: I submit he ought to be shown the map.
WITNESS: I know there is such a map published—practically the same.
Q. It is a fact, Captain, is it not, that the channel during all these years has been constantly shifting?
A. It is.
Q. Do you remember approximately the date when the jetty was constructed by the Federal government?
A. When it was commenced?
Q. Yes.
A. I couldn't say.
Q. It was along in 1885, was it not?
560 A. Yes.
Q. And the jetty from year to year had been projected farther seaward, has it not?
A. Yes.
Q. The result of the construction of that jetty has been to hold the sand south of it and to shoal the water on the Washington shore, has it not?
A. To deepen the water on the Washington shore.
Q. To deepen the water on the Washington shore?
A. I think so.
Q. Has the water in the vicinity of Sand Island increased in depth since the construction of that jetty?
A. It has.
Q. Where, Captain?
A. Over by Buoy No. 1½.
Q. And where is Buoy No. 1½?
A. Over in here. (Pointing on map.)
Q. Has it had a tendency to increase the depths north of Sand Island as it exists at the present time?
A. No.
Q. Is it not a fact that the channel north of Sand Island for years has been gradually and constantly decreasing?
A. It is.

Q. And is it not a fact that the channel between Cape Disappointment and the nearest portion due west of Sand Island, approximately the old Sulphur Spit, has decreased in depth to such an extent that it is not now passable at all for ocean-going vessels?

A. That is a fact.

Q. And it is only passable for vessels of the very lightest
561 draught and at high tide?

A. Yes.

Q. And it is a fact that the channel northerly of Sand Island, easterly up the river, has so decreased in depth that it is not now navigable by ocean-going vessels at any time?

A. Oh no, that is not a fact. We have a quarantine station up there.

Q. I mean immediately north of Sand Island, coming out of Ilwaco.

A. Oh, that is full of fish traps. That sand has always been there. There hasn't been very much change inside there.

Q. And at the present time it isn't possible for an ocean-going vessel to pass north of Sand Island?

A. Oh, no.

Q. It is a fact that that channel at low water does not exceed three feet in depth?

A. That is about right.

Q. And can only be used by vessels of the very lightest draught, going in at full tide?

A. That is it.

Q. You spoke of channels passing north of Sand Island which were used by ocean-going vessels, and I understand you fixed the date as 1867; was it?

A. Yes.

Q. Sand Island as it existed at that time was very much farther south than at the present time?

A. Very much.

Q. And the channels which you have testified as having been pursued by vessels coming up the river and going north of Sand Island would be south of Sand Island as it now exists, or, rather, would cut off the southerly portion of Sand Island?

562 A. Yes.

Q. The course which is now pursued by vessels carries a boat close to Tansy Point, to Fort Stevens and to Astoria?

A. Yes.

Q. And then up quite close to Tongue Point, thence in a northeasterly direction over to Yellow Bluffs; it follows then along the Washington shore, going south of Pillar Rock and back towards the Washington shore?

A. It goes north of Pillar Rock.

Q. Well, a year or two ago it went south of Pillar Rock, did it not?

A. Yes.

Q. When was the change made from south of Pillar Rock to north of Pillar Rock?

A. That was done by dredging.

Q. Did you ever navigate the river as a pilot or captain above Astoria?

A. Yes sir.

Q. How many years, Captain?

A. Thirty years, I expect, or more.

Q. When did you first go on the upper river above Astoria?

A. When I first came to Oregon I went to Portland back and forth all the time.

Q. Tell me the year, Captain?

A. 1867 and 1868.

Q. You then followed the course, as I understand it, from Tongue Point up through the Woody Island channel?

A. Yes.

Q. And at first your course passed south of Woody Island, what is known as the Woody Island channel?

A. South of Snag Island,—not Woody Island.

Q. I mean Snag Island.

563 A. Yes.

Q. Subsequently the Cordell channel was discovered and that was used for some time?

A. Yes sir.

Q. Are you familiar with the construction of a jetty by the Government or by the Port of Portland Commissioners which exists on Snag Island?

A. I am.

Q. The effect of the construction of that jetty was to effectually close up Cordell channel, was it not?

A. It was supposed to.

Q. It actually did, did it not, Captain?

A. Yes.

Q. It was built right across the entrance to Cordell channel?

A. That channel was a pretty hard place to keep open anyhow at all times, because down below at the entrance was what they call a "hog's back," and they had to keep dredging that out to keep water going up in here.

Q. The course of the water easterly of Three Tree Point is northwest, is it not, coming from here? (Pointing on map.)

A. Yes.

Q. And the natural direction of that current, after striking the Washington shore at or about Three Tree Point, would be deflected in a southwesterly direction, would it not?

A. It would.

Q. Was it not the experience there that where the water was deflected down the Woody Island channel, it spilled and scattered when it struck Snag Island?

A. Yes.

Q. And the purpose of the construction of this government jetty, which appears to be shown on Washington's Exhibit I, was

564 for the purpose of deflecting and holding this water so that a channel might be established and created along the Washington shore, was it not?

A. Either there or down here. (Pointing on map.)

Q. Well, the effect of it has been this: that since the construction of that jetty the water has been held up against the Washington shore and that that is now the channel used by ocean-going vessels in coming from the ocean up to Portland and back again?

A. I don't think this jetty down here affects that water up there a particle.

Q. You think it does not?

A. No sir. When this channel down here was opened, then the whole channel was open. This channel never has been closed.

Senator FULTON: When you refer to "down here" won't you describe it so it will appear in the record?

WITNESS: I mean where it comes across from Yellow Bluffs to Tongue Point. This jetty up here never affected this channel on the north shore.

Q. It did not?

A. I don't think so.

Q. Some of the witnesses have testified that it did.

A. I don't see why it should, any more than a jetty at Portland would affect the channel on the bar.

Q. You think the construction of the Snag Island jetty influenced the current only to the extent of forcing it through the Woody Island channel, rather than the Cordell channel?

A. I think so.

565 Q. When was this channel which appears to be marked on Washington's Exhibit I as "1905 channel line" first used as a regular course by ocean-going vessels in coming from the ocean to Portland and returning?

A. I really couldn't say.

Q. Could you approximate the time?

A. I could find out by looking at books and charts that I have.

Q. Could you tell whether it was in the 70's or 80's or 90's?

A. Oh, it must have been in the 80's.

Q. It was subsequent to the construction of this jetty on Snag Island, was it not?

A. On Snag Island?

Q. Yes.

A. Oh, yes sir.

Q. As I understand it, you used this channel for the deepest draught vessels passing through Woody Island for quite a number of years?

A. Yes.

Q. Now, you spoke of a wreck existing somewhere in the channel between Tongue Point and Yellow Bluffs. Can you give me the name of that vessel?

A. I can't now; I can find it.

Q. Was it the "Sylvia de Grasse"?

A. No, the Sylvia de Grasse was below Tongue Point.

Q. Can you indicate upon the map the point where the Sylvia de Grasse wreck occurred?

A. Right in Astoria harbor, pretty near; I can come pretty near where it was.

Q. Just describe it approximately, if you will, please, with reference to Astoria and with reference to Tongue Point.

A. It is right here abreast of this black buoy, right in
566 this direction, down in here somewhere; down here near No. 9 buoy.

Q. No. 9 buoy appears upon the lower red line marked "1859 channel line" at the extreme western part of the map, Washington's Exhibit I.

A. It is between No. 8 buoy and No. 9 buoy.

Q. That appears on Washington's Exhibit I, does it not, Captain?

A. Yes sir.

Q. At the extreme western portion of that map?

A. Yes sir.

Q. On the red line marked "1859 channel line"?

A. Yes sir.

Q. Now, Captain, I desire first to go back to Washington's Exhibit H, and ask you if you will be kind enough to show me where the middle channel appears upon that map which you testified to this morning. For purposes of convenience I will refer to Oregon's Exhibit No. 9. Calling your attention particularly to the channel which is delineated upon this map and marked "middle channel", I will inquire of you whether or not that channel was ever used as the usual and customary channel for ocean-going vessels in coming from the sea and proceeding to points on the upper river?

A. I don't think it ever was. I have used it myself, but then it was in a case of emergency, that was all. I have gone through it with a sailing vessel.

Q. It was not the usual course of navigation?

A. No sir.

Q. And it was never considered as being the best channel for navigable purposes?

A. It was never marked.

Q. And it was not buoyed?

567 A. No sir, it was not; it required local knowledge to get to it. But it was there, just the same.

Q. Are you familiar with the condition of that middle channel at the present date?

A. I am.

Q. What is its condition now?

A. It is closed up now.

Q. It is closed up now and cannot be used for navigation except after dredging?

A. That is all; but this other channel can.

Q. I will inquire about that in just a moment, Captain. Are you familiar with the maps of 1859?

A. I have seen them; I have had them in my custody.

Q. Do you know what the condition of that so-called middle

channel was in 1859, as to whether it was available for the purpose of navigation for deep-draught vessels?

A. It might have been available, but it never was used.

Q. It never was used?

A. No sir.

Q. And never was used in 1859 or at any other time?

A. It never was used.

Q. It never was used as the usual course of navigation?

A. No, never.

Q. And in all the years you have been on the river, the course which has been followed by the deep-sea vessels up the river beyond Point Adams was a course close to Tansy Point and to Astoria?

A. Yes.

Q. And in all the years that you have been on the river, vessels, in going to Portland, did not customarily and usually use a course which carried them close to the Washington shore up the river to Three Tree Point?

A. No.

568 Q. I understood you to say that vessels could follow that course up as far as Knappton?

A. Vessels have used it coming down from Portland.

Q. Coming down?

A. Yes.

Q. Were they heavily-laden?

A. No, not heavily-laden.

Q. Vessels heavily-laden would take the southerly channel which passed by Tansy Point and Astoria and on up?

A. Yes.

Q. Are you familiar at the present time with the ruling depths of the channel, we will say from Chinook Point to Knappton?

A. I am.

Q. What is the ruling depth?

A. From Chinook Point to Knappton?

Q. Yes sir. You may, if you desire, refresh your recollection by examining the map, Washington's Exhibit H, which contains the latest hydrography.

A. I know we have got a vessel up there now in Knappton loading for Europe. I suppose it will load to 23 or 24 feet. I don't think there will be any trouble in taking her out.

Q. Tell me what the ruling depth is as shown on that map, if you please.

A. Twenty-four feet at low water; twenty-two feet they have got here.

Q. Is that abreast of Knappton?

A. That is abreast of the quarantine station. 24 feet.

Q. Let me explain that the black printing and figures show the latest hydrography and that the green color and figures show the hydrography of 1851. I desire the present ruling depth as

569 shown by the latest hydrography.

A. The black is the present ruling depth?

Q. Yes.

A. Twenty-four feet, then.
Q. Is that abreast of Knappton?
A. That is not abreast of Knappton; that is below Hungry Harbor.
Q. Give me the depth at Knappton.
A. Up here it is 21 feet. (Pointing on map.)
Q. Now, give me the depths easterly of Knappton.
A. Twelve feet—eight feet.
Q. Then, as I understand it, Captain, the term "ruling depth" in a channel means the depth at the most shallow point.
A. Yes sir.
Q. So that the ruling depth of that channel from Chinook Point easterly over the portion of the river shown on Washington's Exhibit H, would be 8 feet, would it not?
A. That would be at the extreme easterly end.
Q. That would be the ruling depth?
A. Yes.
Q. And of course that is too shallow for ocean-going steamers?
A. Yes.
Q. Now, let me take, on Washington's Exhibit I, that same northerly channel, and I will ask you to give us the ruling depths upon it—on the most northerly channel—being a continuation of the one which passes close abreast of Knappton.
A. Eleven feet.
Q. The shallow portion of that channel exists for a considerable distance, does it not, Captain?
A. Not a very long distance.

Q. Did I understand you to say, in your examination this
570 morning, that in your opinion it would take less dredging to maintain a ship channel along the Washington shore than it would to maintain the present ship channel?
A. I think so.
Q. Is it not a fact, Captain,—and I ask you to examine this map very carefully so that you may be able to answer my question—that it would take something like three miles of dredging to make the north channel following close along the Washington shore available for ocean-going vessels of the deepest draught? You are familiar with the scale of this map so that you understand?
A. I understand the scale thoroughly. It might take more dredging in the first place, but I believe they would keep open better. It would take more dredging now at the present time, but I believe those channels would keep open better than the ones they have.
Q. But it would take dredging now of some 3 miles, would it not, Captain?
A. Oh, I think not as much as that. I think by taking one or two of the shoalest places off that it would not be but a very little while before that would be a practicable channel; and if there was any demand for it down there, if they ever get a town at Frankfort, they will show you it won't take much to operate a channel down on the north shore.

Q. It is not possible at the present time, however, to run a vessel through that channel, is it?

A. No, it is not practicable now.

Q. It is not possible, is it?

A. It is possible at high tide to pass through there.

Q. For an ocean-going vessel of the deepest draught?

A. Oh no, not an ocean-going vessel of the deepest draught.

Q. Has Prairie Channel ever been used?

A. Only by steamboats, river boats.

571 Q. River boats?

A. Yes.

Q. That is a channel that has been used by river boats in past years?

A. Yes.

Q. The Government has used it in taking its scows laden with rock for the jetty through there, has it not?

A. Yes.

Q. It is the most protected channel, is it not?

A. Very much so.

Q. Except as to depths and curvature, it is the best channel down there, isn't it?

A. It is very crooked, though.

Q. I say, except as to curvature, it is the best channel?

A. Yes.

Q. Then, if the Prairie Channel has been used for purposes of navigation, why do you not take it into consideration in fixing these lines which you have done upon Oregon's Exhibit No. 7? You haven't delineated the Prairie Channel upon here as one of the channels which has heretofore been used for commercial purposes.

A. But it is laid out there; it shows for itself.

Q. You have not delineated it here.

A. No. Vessels that I would be associated with do not use that channel at all.

Q. But you have just stated that it has been used for commercial purposes.

A. It has been used by river boats, yes.

Q. If that be the fact, would not this Woody Island channel be the middle channel upon this map?

A. It certainly would.

Q. And it is just as fair to assume that it is the middle channel as the channel which you have named as the middle chan-

572 nel?

A. This channel has been called by other people the "Middle channel." I didn't term it that way. It has always been called by seafaring men the "Middle channel."

Q. For just the short distance shown on Washington's Exhibit H of the Columbia River. But taking into consideration Prairie Channel, Woody Island Channel, and the channel from Tongue Point to Yellow Bluffs, the Woody Island Channel would be the middle channel of the river, would it not?

A. Certainly.

Q. In your experience as a pilot and captain, upon the Columbia River, have you ever known of vessels pursuing a course from the ocean to the upper river which would be shown by this blue line on Washington's Exhibit H, marked "Boundary line as claimed by the State of Oregon"?

A. No.

Q. Such a course has never been used to your knowledge since you have come upon the river?

A. No.

Q. I will inquire of you, Captain, whether, since you have been upon the Columbia River, you have known of a course followed by ocean-going vessels which would be shown by this blue line on Washington's Exhibit I, marked "Boundary line as claimed by the State of Oregon", being a continuation of the same line concerning which I have just interrogated you and which is shown on Washington's Exhibit H?

A. I have known vessels to take this course coming down but not going up.

Q. But not going up?

A. I have known vessels to come down this way to Knappton.

Q. That was out of the usual course?

A. That was in the usual course.

573 Q. I mean, that was an exception to the course?

A. That was their regular route, and they used it regularly. They had no business over on this side; their business was on that side and they consequently went there.

Q. They went there because they had to call at Knappton?

A. They went there because they had to go to Knappton to load, and it was the shortest and best way for them to go there and they used that course.

Q. That was not the course pursued by vessels in going from Portland to the open sea?

A. It was by those particular vessels, yes.

Q. I speak of vessels that had no occasion to stop anywhere.

A. Vessels that had no occasion to stop anywhere, no.

Q. They took the southerly channel?

A. Certainly.

Q. And this northerly channel was pursued by vessels of rather light draught, were they not, Captain?

A. They were, yes.

Q. I don't know whether I inquired of you concerning the movement of Sand Island. It is a fact, is it not, Captain, that Sand Island has moved to the northward some two or three miles?

—. Yes sir.

Q. And has very largely increased in area?

A. That is right.

Q. Captain, what do you understand to be the mouth of a river?

A. The mouth of the river?

Q. Yes.

A. Well, I consider the mouth of the Columbia River from Cape Disappointment to Point Adams—between those two points.

574 Q. You would say, then, that the mouth of the Columbia River would be a line drawn from Cape Disappointment to Point Adams?

A. I certainly should call that the mouth of the river.

Q. I will ask you to examine Washington's Exhibit H, and take the channel line there shown as the north channel line, 1854. The tinting in orange upon that map indicating sands or shoals.

A. Yes sir.

Q. Being the hydrography of 1852?

A. Yes.

Q. I will ask you to indicate the point which you would consider the mouth of the channel.

A. Oh, the mouth of the channel and the mouth of the river are two different things. I would not consider the mouth of the channel the same as the mouth of the river. The channel may be away up here. You asked me in regard to the mouth of the channel; but if you ask me as to the mouth of the river, I say it is directly between those two points.

Q. I have asked you about the mouth of the river, and I understand that perfectly clear. Kindly state now what is the mouth of that channel.

A. The mouth of the channel?

Q. Yes.

A. The mouth of the channel is here. (Pointing on map.)

Q. Then, the mouth of the channel is where the current leaves all confining influences and empties itself into the ocean?

A. Certainly.

Q. And that point would be, would it not, at the intersection, approximately, of this dotted line marked on Washington's Exhibit H as "one marine league due west" of the line marked "north

575 ship channel"?

A. Right here, yes sir. (Pointing on map.)

Q. Just immediately above that blue tinting?

A. Yes.

Q. There are a number of places along the shore of the Washington side of the river at which the river steamers stop in coming from Astoria to Portland and going back?

A. Yes sir.

Q. There are quite a number of little ports on the Washington shore which furnish a few passengers and some freight?

A. Yes sir.

Q. Canneries, sawmills, etc., and little towns such as Cathlamet?

A. Yes sir.

Q. Are you familiar with the character and amount of dredging that has been done up the river from Tongue Point?

A. I am not perfectly familiar with it, no sir.

Q. Have you navigated the upper river of late years, or has your work been confined to the bar?

A. I have navigated both more or less of late years.

Q. Both the bar and the river?

A. Yes, both the bar and the river.

Q. Have you observed the dredging that has been done there?
A. I have, yes sir.
Q. Kindly state about where it has occurred.
A. They have done considerable dredging at Pillar Rock.
Q. Pillar Rock is not very far from Three Tree Point, is it?
A. Not very far from there.
Q. And the dredging there has been done, I understand, between the Rock and the Washington shore?
576 A. Yes.
Q. And the channel has thereby been changed from south of Pillar Rock to north of Pillar Rock?
A. Yes, it has made the channel straight.
Q. That dredging, however, covered a very short distance, did it not—just a few hundred feet?
A. Yes.
Q. Where else has dredging been done?
A. That channel across from Astoria.
Q. That is, from Yellow Bluffs down to Tongue Point?
A. Yes, they have been dredging there and below Tongue Point.
Q. Between Tongue Point and Astoria?
A. Yes.
Q. Do you recall when this wreck that you speak of was removed from the channel between Tongue Point and Yellow Bluffs?
A. I don't think it ever was removed; it just washed away itself.
Q. It just became dismembered and washed away?
A. Yes, I think so. They might possibly have dug it away, but not to my knowledge.
Q. This north channel, Captain, that you have marked upon one of these maps from the bar in, was rather an unusual channel, was it not? It did not exist for a considerable period of time?
A. From outside, you mean?
Q. Yes.
A. Oh, yes.
Q. I mean the channel which you first spoke of as commencing west and abreast of North Head and coming southerly around
577 the Cape, was an unusual channel, was it not,—and existed only a short time?
A. The one that was there in 1867 and 1868, you mean?
Q. Yes.
A. Oh, that lasted a considerable number of years.
Q. About how many years, Captain?
A. I should say five or six years, and more than that.
Q. Are you familiar with the early history of the bar of the Columbia River?
A. I am.
Q. Have you studied the maps back to the Vancouver map?
A. Yes sir.
Q. The Vancouver map showed a channel entrance there approximately the same as it is now?
A. A little farther north.
Q. A little farther north?

A. Yes sir, considerably farther north.

Q. Are you familiar with the Edward Belcher map and the Wilkes map?

A. I am.

Q. Where did those channels appear on those two maps?

A. North of where they are now, considerably, but straight in.

Q. This northerly channel which you speak of here as commencing west of North Head, abreast of North Head, when did that first become available for the use of ocean-going steamers?

A. Oh, we used that along in 1890 and 1891.

Q. It had not been used in the '60's or '70's or the '80's?

A. No.

Q. About what year in the '90's do you think it was first used?

A. It might have been 1889 or 1890, somewhere along there.

578 Q. And it was used only for three or four years, was it not?

A. Yes.

Q. And then the channel came back approximately rather close to the position it had in former years?

A. Yes.

Q. Especially as shown on the Vancouver map?

A. Yes.

Q. And it so exists at the present time?

A. Yes.

Q. You are aware of the fact, I take it, that the Columbia river carries large quantities of sand down, are you not?

A. I am.

Q. And that this sand is washed out across the bar and carried north by the littoral currents?

A. It has not been carried much lately; it has gone south more than north.

Q. Is it not a fact that the prevailing direction of the currents of the Pacific Ocean, along the Pacific coast, are north?

A. No sir.

Q. Are you sure of that?

A. I am sure of it, yes sir.

Q. Are you positive of that?

A. I am positive of it, yes sir.

Q. What is the prevailing direction of the current?

A. South. Why, the flood tide sets in there every day southeast.

Q. At what time of the year——

A. In the winter time there is a northerly set.

579 Q. A northerly set?

A. Yes sir; but that northerly set is checked up by weather; but it starts in in the summer-time, and the current goes south to beat the band and it never goes the other way—7 months in the year.

Q. Is it not the fact that the prevailing direction of the sand movement is north?

A. No sir, not in my experience, not lately.

Q. Is it not a fact that the sand from Cape Disappointment north to Shoalwater Bay has been brought from the south?

A. I don't think so.

Q. You don't think so?

A. I don't think so.

Q. Is it not a fact that that entire peninsula has been brought down by the Columbia River and carried north by the littoral currents?

A. I don't think so.

Q. Are the sandbars and spits south of Point Adams down to Tillamook Head increasing or decreasing?

A. Increasing.

Q. Do you know as to the relative increase between the sands on the shore north and south of Cape Disappointment?

A. I really could not say.

Q. You have had no means of determining that question?

A. I have.

Q. Well, what is your opinion as to the relative increase of the sand deposits?

A. Well, I think that the sands have been deposited more to the south than to the north. Where we had the south channel years ago, now we have a wash there, and we can only get very shoal water.

580 Q. What influence has the construction of this jetty, which, I understand, extends seaward some four miles from Fort Stevens, had on the sand south?

A. Oh, that has made the sand build up south.

Q. Hasn't that jetty held the sand there?

A. It certainly has.

Q. It would otherwise pass to the northward?

A. I don't know where it would pass to, I am sure; that is a conundrum. That jetty made a backbone there, and the action of the current carries the sand to sea, and the action of the sea is to throw it in.

Q. The sand south of that jetty has increased in depth ever since the construction of the jetty, has it not?

A. Yes sir.

Q. And the sand, being brought out, when it reaches the jetty, is forced seaward?

A. It certainly is.

Q. It could not be forced seaward if the prevailing direction of the current was south?

A. That is what I say; that is the reason it builds it up. If it went north, how could the south sands be built up? They are built up more since the commencement of the construction of the jetty, but never before.

Q. If the prevailing direction of those currents is south, why should the sand be stopped at the jetty? Wouldn't the sands accumulate on the north side of the jetty rather than on the south side?

A. I don't think so.

Q. You think if the prevailing direction of the current is south, that the sand would accumulate on the south side?

A. Certainly.

Q. Rather than on the north side?

581 A. Rather than on the north side.

Q. Captain, have you ever known of any buoys in the river becoming loose and drifting out?

A. Oh, yes sir.

Q. Which way do they drift after they get across the bar?

A. Sometimes one way and sometimes another.

Q. Don't they usually drift north?

A. Not necessarily; sometimes they do, but they just as often go south.

Q. I see we can't agree on the prevailing direction of the currents.

A. No, I can't agree with you on that.

Q. Now, Captain, going back to these two channels from the ocean into the river as of 1867 and 1868, it is a fact, is it not, that the water in the south channel was deeper than the water in the north channel?

A. Yes sir.

Q. And that the south channel was shorter and more direct to Astoria than the upper channel?

A. I don't think it was shorter; I think it was longer.

Q. Didn't the south channel come in more directly east and west than the north channel?

A. The south channel came in north and south, and then you had to double on your track and come back, whereas, if you come the other way, you come right straight in.

Q. Are you familiar with the sailing directions of those two channels?

A. I am.

Q. Is it not a fact that those sailing directions say that the south channel is a safe one to beat either in or out? I mean of date 1867 and 1868.

582 A. No. They recommend sailing in the north channel and going out the south.

Q. Is it not a fact that the sailing directions state that the south channel on account of tides and winds was dangerous to sail in?

A. Certainly.

Q. Captain, if the Customshouse was removed from Astoria to Knappton, we will say, without the intervention of artificial aids, could ocean-going vessels take this northerly channel?

A. No, not at the present time.

Q. That is what I mean. Clear at Knappton and then go up.

A. No.

Q. They would still be compelled to use the channel now used and which is shown upon our maps, Washington's Exhibits H and I, marked "1905 channel"?

A. Certainly. But I think that if the same amount of money was expended in the north channel which has been on the south

channel there could have been a permanent channel made on the north side and just as practicable a channel as on the south side.

Q. Was not the channel from Tongue Point to Yellow Bluffs used before dredging commenced?

A. Certainly.

Q. It was used without the aid of dredging for some time?

A. It was.

Q. But yet you say that this north channel cannot now be used unless dredging be first had?

A. That is right.

Q. And the Woody Island channel was used for years without any dredging?

583 A. It was.

Q. Then the presence of the customs house at Astoria is not the sole reason why vessels use the southerly channel at the present time?

A. What is that question?

Q. I say the fact that the customs house is located at Astoria is not the only reason that vessels use this southerly channel?

A. No, that is not the only reason.

Q. Well, now, going back again to the dredging of this north channel: between what points would it be necessary to dredge it to make it available for navigation of deep sea vessels?

A. Oh, they would have to commence right abreast of Knappton and dig up to Portuguese Point and clear above to Gray's Bay.

Q. Clear across to Gray's Bay?

A. Not clear across.

Q. Across to Yellow Bluffs?

A. Yes, part of the way across.

Q. There is only one channel at the present time in the Columbia River which leads from the ocean up beyond Astoria and Tongue Point and Yellow Bluffs and Three Tree Point which is buoyed?

A. Only one. The channel is buoyed into the quarentine station.

Q. Clear out to the ocean?

A. Well, I don't know as you would call it clear to the ocean; the sands are all buoyed there.

Q. Just take Washington's Exhibit H and point where it is buoyed from Knappton out to the sea.

A. It is buoyed from Knappton down to Point Ellice, that is all, and then after that you don't need any buoys. After you get here (pointing on map) you have got any amount of water.

584 Q. The channel is simply buoyed from Knappton to Point Ellice?

A. To Point Ellice; after that it don't require any buoys.

Q. It is not buoyed above Knappton?

A. No. There may be one buoy in a narrow place up above Knappton, in the narrow sands. I think there is a beacon in there and there was a buoy, but whether it is there now or not I don't know.

Q. When did you see it there, Captain?

A. I knew of it two or three years ago. There was a buoy put in

there, but whether it stayed in there or not I don't know. I don't think it is there now. But the beacon is there, right on the lower end of Taylor's Sands, but probably the buoy has gone.

Q. Do you know who owns the mill at Knappton?

A. I think it belongs to the Northwest Lumber Company—A. M. Simpson.

Q. And practically all of these vessels that come up there are owned by Simpson and come to Knappton for the purpose of loading lumber?

A. Oh, no; we have got a big Italian ship loading lumber in there now, for Genoa.

Q. They are either owned by Simpson & Company or come to Knappton for the purpose of getting lumber at the Simpson mills?

A. Yes sir.

Redirect examination.

By Senator FULTON:

Q. Counsel asked you if the mere fact that the port of entry or customs house being located at Astoria was the only reason that vessels now went up on the Oregon side or along the south channel. I ask you if the customs house had been located on the north shore, we will say in the vicinity of Knappton, instead of being located at Astoria, where, in your judgment, would be the channel of
585 commerce and the channel that ships would be traveling today?

A. Certainly on the north side.

Mr. MACDONALD: I want to interpose an objection there, on the ground that it is immaterial and incompetent, and the establishment of a customs house does not control the courses of channels in the river.

WITNESS: I cannot see why it is not just as easy and practicable to keep a channel open on the north side as it is on the south side; for one reason, the river is straighter; you haven't got Tongue Point sticking out there, and I think you can keep a channel open where the current runs straight along just as well and better than you can keep it where you have got to go across it.

Q. Had they not been dredging in the river at the points that have been described, would vessels have been able to go up the south channel to-day?

A. No sir; they would not be able to go above Astoria. The only thing that brings a vessel to Portland is dredging.

Q. Now you understand, do you, Captain, that the jurisdiction of the United States, and hence of any state, is one marine league at sea from the shore?

A. I have read that, yes sir.

Q. What do you understand to be the shore line?

A. I consider that the shore line. (Points on map to Cape Disappointment.)

Q. On the north side, and now on the south?

A. Here—Point Adams.

Q. Then, one marine league at sea from the coast line would be one marine league west of a line between those points?

A. I should think so.

Q. Now you spoke of there being a difference between the mouth of a river and the mouth of a channel. But the mouth of
586 the river is the end of the river channel, is it not?

A. That is right.

Q. When you speak of these channels on the outside, you mean the deep water between the shoal places, out in the ocean?

A. That is it.

Q. After you pass the line between Point Adams and Cape Disappointment, you pass into the ocean, do you not?

A. Yes sir.

Q. Now, outside of that line and west of it, the sands that are indicated on the plat (Washington's Exhibit H), as having been shoals in 1854, are constantly changing, aren't they?

A. Yes sir.

Q. They are not there at the present time, are they?

A. No sir, not as laid down there.

Q. No, not as laid down here.

A. We have got channels down the coast that you can't see the mouth of the river when you enter the channel.

Q. Channels down the coast?

A. Yes, in the Nehalen River. The mouth of the channel is away down at the southern end. You can't see the mouth of the river at all. The mouth of the channel and the mouth of the river are two different things, I should think.

Q. Now, you spoke awhile ago, in answer to counsel for the State of Washington, about the depth of water opposite Knappton and easterly thereof as being at one place 8 feet, and such being the ruling depth in that channel.

A. That is at low water, yes.

Q. Would that be the proper channel to take going from Knappton easterly up the river? Would you not rather take the channel just below that?

A. You could do that of course; come down below that and
587 come over into the middle channel, come across the channel that runs from Tongue Point to Point Ellice.

Q. That would give a better channel, would it not?

A. That would give a better channel, but of course it would not be a direct channel; you would have to come back.

Q. Now, from that point that is indicated by 8 feet of water in the channel just east of Knappton—the north channel—is it not a very short distance over into very deep water?

A. Yes, there is very deep water there. You come across another shoal into very deep water here. (Pointing on map.)

Q. Indicating shoal just south of Portuguese Point?

A. Yes.

Q. You say that the middle channel which opens up, as you have heretofore described in your testimony, down towards Sand Island, and extends up towards Tongue Point, is now closed?

A. Yes sir.

Q. You answered that in answer to a question propounded by counsel for the State of Washington.
A. Yes sir.
Q. Where is it closed?
A. Below Astoria.
Q. At the entrance to it?
A. Yes sir.
Q. That is, you mean, by saying it is closed, that there is a shoal place there?
A. Yes sir, a shoal.
Q. The entire channel is not closed?
A. Oh no.
Q. Or shoaled?
A. No.
Q. Just a short distance, is it?
A. That is all.

Q. It is not so shoal but what vessels of small draught can
588 go over into that?

A. Vessels of heavy draught can go over to Point Ellice and then go up, except in one narrow place; about 14, 15, or 16 feet of water on it at low water.
Q. Fourteen to sixteen feet at low water at that shoal place you mentioned?
A. Yes.

(After taking the testimony of C. G. Brown, a witness on behalf of the State of Oregon, and which is set out at another place in this record, the hearing adjourned, until July 25, 1906, at ten o'clock A. M., Hotel Portland, Portland, Oregon, at which time, both parties being represented, the following testimony was introduced:)

Capt. GEORGE WARREN WOOD recalled on behalf of the State of Oregon, testified as follows:

By Attorney-General CRAWFORD:

Q. Captain, in what you have designated in your testimony as the middle channel, is that what is commonly known and has been during the past years commonly known as "Middle channel", by seafaring men?
A. It has been.
Q. It was so known in 1868 when you first came to the country?
A. Yes sir.
Q. You may state whether in your testimony, in referring to a channel out in the ocean, ten, fifteen or twenty miles, you would call that the river channel, or a bar channel, or what.

589 A. I would call it bar channel. I think after the water leaves the vicinity of the shore it is the ocean; whether it is shallow or deep it does not make any difference, it is ocean just the same.

Q. You spoke in your cross-examination of the discovery of Cordell channel. What do you mean by the discovery of the Cordell channel? Explain that.

A. Why, we sounded through the channel, reduced the soundings and found there was good water through this channel.
Q. When was that?
A. That was in the spring of 1867 or 1868.
Q. Do I understand you to mean that prior to that there was no known channel there?
A. The channel probably had existed there, but it was not known and was not used.
Q. Who discovered that?
A. The Cordell surveying expedition at that time. I took through the first vessel that went through there, the "John L. Stevens".
Q. When you stated in your cross-examination yesterday that the channel commenced at a certain point which you designated on the plat, and which was a considerable distance out to sea, you may state whether you meant the channel crossing the bar.
A. The channel crossing the bar, yes sir.
Q. You may state about how far it is across the Columbia River bar from the mouth of the river.
A. Well, the shoal water is very restricted, it is very narrow, but then we come through breakers quite a long distance, from 3 to 5 miles. But the real shoal is very, very narrow.

589½ By Mr. MACDONALD:

Q. Captain, I desire once more to direct your attention to Washington's Exhibit H. Assuming, for the purpose of my question, the initial point in the description to be at the intersection of this red line marked "1 marine league due west", with the black line marked "1905 channel", at the most westerly point of the map; the description, as I say, commencing one marine league at sea west and opposite the middle of the north channel;—taking this line as the north ship channel, marked "north channel line 1854", in such a description, what would you conceive to be the middle of the north ship channel—the first point in the middle of the north ship channel?
A. I would consider it here. (Pointing on map.)
Q. That is to say, the intersection of the red dotted line marked "one marine league due west" with the other red line marked "north channel line 1854"?
A. I should say so, yes.

By Attorney-General CRAWFORD:

Q. That, Captain, is of the bar channel, or of the river channel?
A. Of the bar channel.

By Mr. MACDONALD:

Q. And that, Captain, is the channel which enters from the ocean to the river?
A. That channel enters, and another one enters too.
Q. Yes, but I am speaking only of the north ship channel.
A. Of the north ship channel, yes.
Q. That is the entrance from the ocean to the river?
A. Yes sir.

590 By Mr. ALLEN:

Q. Captain, I understand you to say that the north ship channel in those days virtually had two entrances.

A. Yes.

Q. One which might be termed the south entrance to the north channel?

A. Yes.

Q. And the other the north entrance to the north ship channel, which was closer to Cape Disappointment?

A. Yes, they come together.

Q. And it was possible to sail in at one entrance and out the other without going into the Columbia River?

A. Yes sir.

By Mr. MACDONALD:

Q. What date was that?

A. I really couldn't say now, but I can find out.

Q. You would not be prepared to say that that condition of affairs existed in 1858 or 1859, would you, Captain?

A. I would not say so, but still it might have been at that time. I couldn't positively swear.

Q. And you would not say that such condition exists at this time?

A. Oh, no.

Q. Nor in 1905?

A. No.

Q. Do you hold your license from the Board of Pilot Commissioners of the State of Washington?

A. Yes sir.

Q. I assume that you also hold a license from the Board of Pilot Commissioners of the State of Oregon?

A. Yes sir.

Q. What is the character of the examination of the Pilot Commissioners of the State of Oregon with reference to exam-ing pilots as to channels in the river? In other words, as to what channels in the river do the Board of Pilot Commissioners of the State of Oregon examine you?

591 A. They don't examine us with reference to any; they are not qualified to examine a pilot.

Q. Do they, then, issue a license without an examination at all?

A. They certainly do.

Q. That is in the case, is it, only of experienced and able pilots like yourself?

A. They only issue licenses to men that are recommended by other pilots; that has been their custom.

Q. Well, if a new man comes on there who has never held a license, I assume they would examine him; wouldn't they?

A. They certainly would, I think.

Q. Do you know the character of such an examination, as to the channels?

A. They would examine him as to all the channels, every channel

there is, because it would be necessary for him to take a vessel up to the quarantine station or Knappton.

Q. How about the examination of those fellows over in Washington—what do they do?

A. Just the same.

Q. They don't make any examination, either.

A. No. That is the way pilots are appointed. A man has to have service either on a tugboat or a pilot-boat before he can ask for anything of that kind.

592 *Act of Legislature of Oregon Ceding Sand Island, etc., to U. S. Government.*

Attorney General CRAWFORD: The State of Oregon now offers in evidence a certified copy of the Act of the Legislative Assembly of the State of Oregon, passed the House October 19, 1864, and passed the Senate October 20, 1864, and approved by the Governor October 21, 1864, ceding Sand Island and the adjoining tide lands to the United States Government, and asks that the same be marked Oregon's Exhibit No. 13.

The instrument was so marked, and signed by the Commissioners.

Mr. MACDONALD: The State of Washington objects, upon the ground that it is incompetent, irrelevant and immaterial; that the State of Oregon never owned Sand Island and therefore could not convey it; and furthermore, that the Supreme Court of the United States will take judicial knowledge of all general acts of the Legislature.

Oregon's Exhibit No. 13 reads as follows:

"UNITED STATES OF AMERICA:

STATE OF OREGON,
OFFICE OF THE SECRETARY OF STATE.

I, F. I. Dunbar, Secretary of State of the State of Oregon, and Custodian of the Seal of said State, do hereby certify that the annexed is a full, true and complete copy of House Bill No. 65, entitled "An Act to grant to the United States all right and interest of the State of Oregon to certain tide lands herein mentioned," as the same is now on file in this office.

In testimony whereof, I have hereunto set my hand and affixed hereto the seal of the State of Oregon.

Done at the Capitol at Salem, Oregon, this 24th day of
593 July, A. D., 1906.

F. I. DUNBAR,
Secretary of State.

(Seal of the State of Oregon affixed.)

An Act to grant to the United States all right and interest of the State of Oregon to certain tide lands herein mentioned.

Be it enacted by the Legislative Assembly of the State of Oregon:

SEC. 1. There is hereby granted to the United States, all right and interest of the State of Oregon in and to the land in front of Fort Stevens, and Point Adams, situate in this state, and subject to overflow between high and low tide, and also to Sand Island situate at the mouth of the Columbia river in this state; the said Island being subject to overflow between high and low tide.

SEC. 2. The Governor of this state shall cause two copies of this act to be prepared and certified under the seal of this state, and forward one of such copies to the Secretary of War of the United States, and the other of such copies to the commanding officer of this district of the military department of the Pacific Coast.

Passed the House Oct. 19th, 1864.

I. R. MOORES,
Speaker of the House of Representatives.

Passed the Senate Oct. 20" 1864.

J. H. MITCHELL,
President of the Senate.

Approved October 21st A. D. 1864.

ADDISON C. GIBBS,
Governor of Oregon

Endorsed: H. B. No. 65."

594 G. G. BROWN being duly sworn, as a witness on behalf of the State of Oregon, testified as follows:

Direct examination.

By Attorney General CRAWFORD:

Q. Mr. Brown, you may state your name, age and residence.

A. G. G. Brown, 38; Salem, Oregon; Clerk of the State Land Board of the State of Oregon.

Q. How long have you been Clerk of the State Land Board of the State of Oregon?

A. Since the first of April, 1903.

Q. You may state whether, as Clerk of said Board, you have the care and custody of the records of the Board.

A. I do.

Q. And the books?

A. Yes sir.

Q. And the seal of the Board?

A. Yes sir.

Q. You may examine this list, and state what it is, Mr. Brown. (Handing paper to the witness.)

A. This is a list of tide lands sold by the State of Oregon in the Columbia River, lying west of Range 7, West of the Willamette Meridian, as designated upon Plat Oregon's Exhibit No. 8.

Q. You may state whether you have compared that list and checked it with the plat and know it to be correct.
A. I have.
Q. You may state what that list shows.
A. The names of the State's grantee and date of conveyance.
Q. By whom?
A. By the State.
Q. To whom? To the respective grantees?
A. To the respective grantees.

Q. You may state whether you checked that list with
595 Oregon's Exhibit No. 8.

A. Yes, I did.
Q. And you state that the list shows the names of the persons and the date of the deeds from the State of Oregon to the purchasers of lands in the Columbia River designated on this plat.
A. It does.
Q. You may state whether the State of Oregon executed deeds to those respective purchasers.
A. It did.
Q. As mentioned in said list?
A. At the date given opposite their names.
Q. In the usual form required by statute of the State of Oregon?
A. Yes sir.
Q. And executed in the manner required?
A. Yes sir.

Attorney General CRAWFORD: We offer said list in evidence and ask that it be marked Oregon's Exhibit No. 10.
The same was so marked, and signed by the Commissioners.

Q. You may take that list to which you have testified and state the names of the persons to whom and the dates of the deeds issued by the State of Oregon to the lands upon this map, as you have testified.

Mr. MACDONALD: I submit that the list shows for itself. I am offering no objection to the list, and I think it speaks for itself.
Attorney General CRAWFORD: With that explanation we will take the list instead.

Oregon's Exhibit No. 10 reads as follows:
"The following is a list of tide lands sold by the State of Oregon in the Columbia River, lying west of Range 7 West of the Willamette Meridian:

Grantee.	Date.
George Kaboth	April 23, 1892.
596 Lena F. Welch	August 30, 1902.
Nora Fitzpatrick	August 2, 1897.
Frank J. Taylor, Ione E. White, E. A. Taylor, Mary F. Strong, Kate Taylor	March 14, 1905.

Geo. H. George	November 11, 1904.
John T. M. Harrington	March 27, 1903.
John T. M. Harrington	April 26, 1902.
Martin Ryan	April 10, 1894.
John T. M. Harrington	March 27, 1903.
Martin Foard	November 25, 1903.
A. M. Smith	March 29, 1897.
Daniel H. Welch	February 11, 1904.
D. H. Welch	August 5, 1897.
Mary Oliver	October 3, 1892.
J. C. Carlson	September 30, 1895.
Samuel Oliver	October 1, 1883.
Samuel Oliver	October 1, 1883.
Jonathan G. Elliott	October 1, 1883.
J. W. and V. Cook	December 10, 1877.
Geo. Kaboth	February 13, 1896.
Samuel Oliver	October 1, 1883.
Samuel Oliver	October 1, 1883.
Chas. Wood	April 10, 1895.
Alex Grant	August 11, 1903.
Chas. Elliott	June 19, 1902.
Geo. W. Sanborn	June 20, 1903.
Thomas Spencer	August 29, 1900.
Nels. Peterson	May 25, 1901.
W. E. Tallant	June 22, 1904.
Geo. W. Sanborn	June 20, 1903.
Thomas Spencer	August 29, 1900.
Otto Carlson	May 25, 1904.
George Kaboth	May 12, 1904.
N. Kerseage	April 6, 1901.
Geo. H. George	December 24, 1903.
Nicholas Kerseage	March 18, 1896.
Alex Grant	June 29, 1904.
Robert S. Farrell	May 25, 1901.
C. R. Donohoe	May 16, 1901.
David Dupee	May 18, 1897.
Richard A. Cearns	August 27, 1895.
D. H. Welch	November 29, 1897.
Samuel Oliver	November 25, 1892.
Martin Ryan	April 20, 1891.
A. P. Anderson	May 22, 1885.
F. Cook	August 31, 1896.
Jas. J. Stokes	January 12, 1900.
Geo. W. Sanborn	June 20, 1903.
James J. Stokes	May 11, 1891.
Geo. W. Sanborn	November 22, 1902.
Jay Tuttle	April 12, 1884.
Geo. W. Sanborn	November 22, 1902.
R. Luddington	February 13, 1896.
Lena F. Welch	December 6, 1902.
Nora Fitzpatrick	January 10, 1905.
Sylvester Farrell	January 10, 1905.

	Nora Fitzpatrick	May 8, 1900.
597	A. C. Schoenebeck	March 29, 1899.
	G. A. Nelson	November 7, 1891.
	Richard Harry	March 26, 1898.
	W. F. McGregor	August 26, 1891.
	D. H. Welch	August 26, 1891.
	J. W. Cook	July 18, 1887.
	H. G. Van Dusen	September 23, 1891.
	John Hobson and A. Van Dusen	February 17, 1879.
	L. F. Welch	June 20, 1903.
	Wm. H. Barker	April 22, 1891.
	H. Marks	May 9, 1891.
	Wm. H. Barker	April 22, 1891.

Cross-examination.

By Mr. MACDONALD:

Q. You did not prepare this map, Oregon's Exhibit No. 8?

A. No; it was prepared by the State Engineer.

Q. You don't know whether it is correct or not?

A. No, I couldn't testify as to that; of course, I didn't compare the map.

Q. You simply compared this list that you have introduced in evidence with the names that appear?

A. Yes, that is correct.

Attorney General CRAWFORD: The State of Oregon now offers in evidence certified copy of deed from the State of Oregon to J. W. and V. Cook, dated 10th day of December, 1877, and asks that the same be marked for identification Oregon's Exhibit No. 11.

The same was so marked, and signed by the Commissioners.

Attorney General CRAWFORD: The State of Oregon also offers in evidence certified copy of deed from State of Oregon to F. Cook, of date August 31, 1896, found in State Record of Deeds, Book V, Page 281, and asks that it be marked Oregon's Exhibit No. 12.

The same was so marked, and signed by the Commissioners.

598 Attorney General CRAWFORD: We ask that the reporter be permitted to detach these two deeds offered in evidence from the bunch of deeds which are produced and certified together, and that they be received in evidence with the certificate.

Mr. MACDONALD: All right.

Oregon's Exhibit No. 11 is as follows:

"STATE OF OREGON:

In consideration of One Hundred and forty three 75/— dollars paid to the Board of Commissioners for the sale of School Lands, the State of Oregon doth grant, bargain, sell and convey unto J. W. and V. Cook his heirs and assigns, the following described premises, to-wit:

All of the land lying between ordinary high tide and ordinary low tide embraced within the limits of what is commonly known as Snag Island in the Columbia River and in Sections 25 and 26, Township 9 North Range 8 West, Willamette Meridian, as shown upon the plat of the survey thereof made by Hayden Gearhart, County Surveyor of Clatsop County, containing 115 acres of tide land more or less.

The lands herein conveyed are sold under an act of the Legislature of Oregon entitled 'An act to Provide for the sale of Tide and Overflow Land on the Sea Shore and Coast,' approved Oct. 26, 1872, and the acts amendatory thereof.

To have and to hold, the said premises, with their appurtenances unto the said J. W. & V. Cook, his heirs and assigns forever.

Witness, the Seal of the State affixed this 10th day of December 1877.

S. F. CHADWICK, *Governor.*
S. F. CHADWICK, *Secretary.*
A. H. BROWN, *Treasurer.*

Book G, page 248."

599 Oregon's Exhibit No. 12 is as follows:

"STATE OF OREGON:

In consideration of Eighty Seven and 63/100 Dollars, paid to the Board of Commissioners for the sale of School, Universit- and other State Lands, the State of Oregon does hereby grant, bargain, sell and convey unto F. Cook his heirs and assigns, the following described Tide lands situate in Clatsop County, Oregon, to-wit:—

Beginning at a point 4.60 chains South and 369.45 chains West of the ¼ corner between Sections 19 and 20, Township 9 North, Range 6 West of Willamette Meridian and running thence:

S. 29° 00′ W.	11.50 chains
N. 81° 15′ W.	12.00 chains
S. 61° 00′ W.	11.00 chains
S. 82° 35′ W.	7.00 chains
S. 49° 00′ W.	8.70 chains
S. 58° 10′ W.	11.00 chains
S. 79° 25′ W.	3.00 chains
S. 50° 30′ W.	10.50 chains
N. 22° 00′ W.	0.60 chains
N. 29° 50′ E.	7.00 chains
N. 51° 50′ E.	16.50 chains
N. 48° 10′ E.	13.00 chains
N. 46° 30′ E.	16.00 chains
N. 68° 15′ E.	13.00 chains
N. 64° 24′ E.	13.58 chains
East	4.50 chains
S. 21° 00′ W.	15.00 — to place of beginning,

containing 70.11 acres.

To have and to hold the said premises, with their appurtenances, unto the said F. Cook, his heirs and assigns forever.

Witness the seal of the State, affixed this 31 day of August, 1896.

[SEAL.] WM. P. LORD, *Governor.*
H. R. KINCAID, *Secretary.*
PHIL METSCHAN, *Treasurer.*

State Record of Deeds, Book V, Page 281.

600 The certificate attached to the deeds among which are Oregon's Exhibit No. 11 and Oregon's Exhibit No. 12, as before set forth, is as follows:

"STATE OF OREGON, *County of Marion, ss:*

I, G. G. Brown, hereby certify that I am the duly appointed, qualified and acting Clerk of the State Land Board of the State of Oregon, and as such am the legal custodian of the records and seal of such Board; and I hereby further certify that I have carefully compared the foregoing transcripts of deeds with the original record of the same in my office and under my care and custody, and that the same are true transcripts of such original records and of the whole thereof as far as the same relates to such deeds, and the same are found in the Records of Deeds of the State Land Board of the State of Oregon, in the following books and at the pages hereinbelow mentioned, to-wit:

Book.	Page.
G	248
...	...
V	281
...	...
...	...
...	...

In testimony whereof, I have hereunto set my hand and affixed thereto the seal of the said Board.

Done at the Capitol at Salem, Oregon, this 23rd day of July, A. D. 1906.

[Seal of Oregon, Land Department.]

G. G. BROWN,
Clerk of the State Land Board.

601 By Attorney General CRAWFORD:

Q. You may state whether all the deeds to which the list of deeds received in evidence refers, are substantially in the same form as the two deeds which have been introduced in evidence.

A. They are.

Q. And whether that is the customary form prescribed by statute of the State of Oregon for State Deeds.

A. It is.

602 H. G. VAN DUSEN being duly sworn as a witness on behalf of the State of Oregon, testified as follows:

Direct examination.

By Attorney General CRAWFORD:

Q. State your name, age, residence and occupation.

A. H. G. Van Dusen; residence, Astoria; age, 47; occupation, Fish Master Warden of the State of Oregon.

Q. You are the Master Fish Warden of the State of Oregon, are you?

A. Yes sir.

Q. How long have you been such Fish Warden?

A. Since March 7, 1901.

Q. You may state whether, as such Master Fish Warden, it becomes your duty to issue licenses to fishermen on the Columbia River.

A. Yes, it does.

Q. Fishermen fishing within the jurisdiction of the State of Oregon.

A. Yes sir.

Q. You may state what kind of licenses you issue.

A. All sorts of net and gear licenses, enumerated gill net, set-nets, traps, seines, fishwheels.

Q. You may state what a gill net is, and how it is operated.

A. A gill net is a drift net; it is a net that drifts with the tide.

Q. You may state what a set-net is.

A. — set-net is a net that is set at some particular point for the purpose of gilling salmon.

Q. And a trap is what?

A. A trap is a stationary contrivance that has a long lead with a pot or trap at the end of the lead which holds the salmon when once entrapped therein.

Q. You may state what a seine is.

603 A. A seine is a net contrivance that is operated by one end of it being held stationary to some sand bar or spit, and the other end is towed out around through the channel in such manner as to entrap all the fish within the sweep of the net; the two ends are brought together on the sandbar or spit, and all fish are caught by pulling those two ends up. Those seines are generally operated from some sandbar or ground, and the fish are brought up and landed on that bar or ground.

Q. You may state as near as you can the importance of the fishing interests in the Columbia River, in the vicinity of Astoria and Three Tree Point.

A. It is a resource that amounts to somewhere in the neighborhood of three million dollars a year.

Q. About how many men are employed in it?

A. Between five and six thousand.

Q. You may state whether the fishing industry makes the islands and bars in the Columbia River involved in this litigation, and situ-

ated in the Columbia River west of Three Tree Point, valuable for fishing purposes.

A. Yes sir, it does.

Q. You may state whether, during your term of office you have issued licenses to any person for fishing privileges on the islands and sandbars and tideflats between Three Tree Point and the ocean, in the Columbia River.

A. Yes, I have.

Q. You may state to whom, when, and for what islands and sandbars.

A. May I use my notes to make that accurate?

Q. You may use any memorandum you have to refresh your memory, that was made at the time.

A. May 20, 1901, two seine licenses were issued to W. A. F.
604 Schoenbeck, to operate a seine in Prairie Channel just below Swenson. Two seine licenses were issued to George H. George, June 12, 1901, Desdemona Sands; two licenses to Tom Spencer for the Spencer Sands.

Q. Where are the Spencer sands?

A. They are located below Snag Island?

Q. About how far below?

A. Here they are. (Pointing on blue print.)

Q. You may state whether that is nearly due west of Snag Island.

A. Yes sir, it is.

Q. A little south of west?

A. A little south of west.

Q. Proceed.

A. Two licenses were issued to George Kaboth for the Kaboth Grounds.

Q. Where are they located?

A. They are located close to Snag Island, and are designated as the Kaboth Sands on Oregon's Exhibit No. 8. On August 12, 1901, a seining license was issued to Nick Kereage, on the Barrel-Beacon Sands.

Q. State where that is, as near as you can.

A. About one-half mile south of the westerly extremity of that portion of this map, Oregon's Exhibit No. 8, designated as the Alex. Grant Sands. Those were all issued during the year 1901. In 1902 Stensland & Sons were issued a license to operate a seine in the Prairie Channel. Frank Cook was issued two licenses to operate on the Enyert & Cook's Grounds, opposite Three Tree Point.

Q. Is the seining ground which you have just designated as the Enyert & Cook grounds that which is designated on Oregon's Exhibit No. 8 as immediately west of the figures "21," as designating Section 21, and south of Jim Crow?

A. Yes sir. George H. George was issued two licenses for
605 the Desdemona Sands; George Kaboth was issued two licenses for the Kaboth grounds; George W. Sanborn was issued two licenses for the Bay View Sands.

Mr. ALLEN: Are those the sands which are designated on Ore-

gon's Exhibit No. 8 as lying southwest of Three Tree Point and adjacent to those designated as the A. P. Anderson Sands?

WITNESS: Yes. George W. Sanborn was issued two licenses for the Spencer Sands.

Mr. ALLEN: Are those the sands designated upon Oregon's Exhibit No. 8 as Thomas Spencer and George W. Sanborn 43.79 acres?

WITNESS: Yes; that is, as I understand it. That is what they call the Spencer grounds. The Miller Sands Fishing Company was issued two licenses for the Miller Sands.

Q. State where they are located.

A. Up here; designated on Oregon's Exhibit No. 8 as the point marked "J. G. Elliott and David Dupee." The Columbia River Fishing Company had two licenses for the Sam Oliver grounds.

Q. Where are they located?

A. They are located on Oregon's Exhibit 8 as "S. Oliver, 57 A, U 300." Thomas Taylor was issued two licenses for the Taylor Sands, designated on this map, Oregon's Exhibit No. 8, as "J. T. M. Harrington, 115.56 A; Z 267;" "Martin Ryan, 45.03 A, U 745." Fritz Miller was issued a license to seine on the Barrel-Beacon Grounds.

Q. You may state now whether since 1901 and 1902 you have issued licenses upon these same lands and islands.

A. Yes, I have.

Q. You may state whether you have issued a license to fish upon Kersage Sands since you have been Master Fish Warden, as
606 said sands are designated upon Washington's Exhibit K.

A. Yes, I have, but I had better find the memorandum.

Q. You may state whether you have issued fishing licenses for the Johnson Sands as they are designated on Washington's Exhibit K.

A. I have issued licenses for the Welch-Taylor Sands; I have issued licenses for the Welch and Taylor sands all through here, but never any for a man by the name of Johnson. I don't think a man by the name of Johnson has ever fished since my time; but licenses have been issued for Welch and Taylor, and to Alex. Grant for the Hog Back Grounds, and for McGowan and Grant for the Hog Back Grounds, which is along in this territory. (Pointing on map.)

Mr. MACDONALD: Show where the Hog Back grounds are.

A. They are shown on Oregon's Exhibit No. 8 as the Alex. Grant grounds, 46.99 acres, 27-395.

Mr. MACDONALD: That is due south of Gray's Bay?

WITNESS: Yes.

Q. State whether you have issued licenses for Bowman's Sands.

A. I don't know where they are located.

Q. You may state whether during your term of office you have issued licenses for fishing privileges on Henry's Sands.

A. I know of no sands known by that name at the present time.

Q. You may state whether you have issued licenses for Helgerson's Sands.

A. I don't know of any sands by that name. I would like to make an examination of the map and answer the question later.

Q. You may state, if you know, whether your predecessor in office issued licenses for fishing privileges upon the numerous sands, sandbars and sand islands mentioned by you in your testimony.

607 A. No, I don't know. I suppose, of course, that he did.

Q. You may state whether you have the records of your predecessor in office in your possession.

A. No, I have not.

(Recess until 2 o'clock P. M.)

Q. You may state whether you have been able since adjournment to locate Helgerson's, Reed's, or Henry's Sands.

A. I have not been able to locate Henry's Sands, but the Helgerson Sands are between Three Tree Point and Jim Crow Point.

Q. You may state whether you have issued licenses for those.

A. Not under that name, that I know of.

Q. You don't know whether you have issued licenses to cover the same land or not?

A. No, I do not. The Reed ground, which I suppose you refer to, is situated below the Oliver Sands; I don't know but what they are a part and parcel of the Oliver Sands.

Q. Have you issued licenses covering that ground?

A. My licenses cover the Oliver grounds, and I think that the people that operated there included the full sweep of country. Then there is another ground you asked me about—the Colwell grounds. While I am here, let me include those. The Colwell grounds are a part of the Kaboth grounds.

Q. You may state whether you have issued licenses for fishing privileges on Sand Island?

A. Yes, I have.

Q. You may state whether there was any understanding between you and the former Fish Commissioner of Washington relative to what sands you should collect license fees and issue licenses for during this litigation, and, if so, state what that understanding

608 was.

A. It was simply an understanding between us that we would not compel a certain class of seiners to pay licenses to both states or a double license during this controversy. Some of them had been taking out both an Oregon license and a Washington license up to the time of this controversy. After this suit was commenced, thinking that the boundary matter would soon be settled, we thought that it would not be out of the way for us, under the circumstances to agree on a sort of a division, and we did so.

Q. What was the division? What did you agree upon?

A. I agreed to let him have the Oliver Sands and the Tom Taylor Sands, and I would retain control of the Miller Sands and the Hog's Back and the Barrel-Beacon grounds.

Cross-examination.

By Mr. MACDONALD:

Q. As I understand this agreement, which you have testified to as having been made, it was made with Mr. Burton or with Mr. Kershaw?

A. It was made with Mr. Burton under Mr. Kershaw's instructions, as I understand.

Q. You mean Mr. Linck. C. Burton, who was then and is now Deputy Fish Commissioner of the State of Washington and in immediate charge of the fishing interests on the Columbia River.

A. Yes.

Q. And I understand that agreement was one whereby you attempted to divide the territory in dispute so that each state would receive about the same amount of license money?

A. From those grounds that were in controversy.

Q. Your idea was that each state was to get about the same amount of money?

A. Yes, something like that. I don't think we were so particular.

609 Q. Was that agreement fully carried out?

A. It was carried out as fully as we could carry it out. It extended up the river a little farther, and we got left on something up the river, but I don't think Mr. Burton could help that.

Q. This was in 1905, was it not?

A. Yes.

Q. And the Legislature of Washington in the year of 1905 very materially increased its license fees, did it not?

A. Yes sir.

Q. And a firm known as Everding & Farrell got in there under the old law and took out their license for 1905, so that they had it issued and in force before the 1905 law went into effect, didn't they?

A. That is a matter you should ask the Washington Commissioner about.

Q. That is on the Tom Taylor Sands?

A. That is something I know nothing about.

Q. Well, isn't that one reason why this agreement was not fully carried out and you got the worst of it, as you say?

A. No, that is not what I meant.

Q. What did you mean, then?

A. Well, I meant that I was to have a division of the territory on up the Columbia River which included Walker's Island, and that was in regard to traps. Mr. Burton was to take the traps on the Washington side, the north side of the Island and the jetty, and I was to take the traps on the south side. They could get their license cheaper from Washington, and so they disregarded me entirely and got their licenses from Washington.

Q. And didn't apply to you for a license at all, did they?

A. No. But we don't want that in the record; do you?

610 Q. Just answer my questions. This agreement was not made in pursuance of any statutory authority conferred upon you by the State legislature of the State of Oregon, was it?

A. Oh no.

Q. Nor was it entered into by you under authority of the Governor of your state, was it?

A. I consulted with the Board of Fish Commissioners in regard to it.

Q. I am not familiar with the laws of Oregon relating to the Board of Fish Commissioners. Please tell me of whom it is composed.

A. The Governor, the Secretary of State and the State Treasurer.

Q. And you conferred with them, you say?

A. Yes.

Q. And this agreement was a temporary, tentative agreement, pending the settlement of this lawsuit in which we are now engaged?

A. As I understood it, yes.

Q. The lawsuit had then been commenced or was about to be commenced?

A. Yes.

Q. Was that after the visit made by the governor of the State of Washington, our Fish Commissioner, Senator Welsh, Deputy Fish Commissioner Burton, myself, and others, to Astoria in the early part of 1905, at which time we had a conference with Attorney General Crawford, of Oregon, concerning the suit which was then about to be brought?

A. I couldn't say for sure whether it was then or before, but I think that we had taken it up before. It was mentioned at that time.

Q. At any rate, at the time this agreement was made, you
611 were aware that this suit either had been brought or was about to be brought?

A. Yes sir.

Q. You knew that the legislature of the State of Washington had made provision for instituting this suit?

A. Yes sir.

Q. I understood you to say that the fishing interests were of the value of perhaps three millions of dollars?

A. Yes, on the Columbia river.

Q. You mean per annum?

A. Yes.

Q. Do I understand by that, Mr. Van Dusen, that that is the value of the entire fishing interests of the Columbia river or only the value of the State of Oregon.

A. No, I mean the general value to the lower Columbia river.

Q. That is, to both states?

A. To both states.

Q. That is the value of the fishing industry of the entire lower portion of the river?

A. Yes sir.

Q. That portion of it which is in controversy in this action?

A. Yes. It is an estimated value.

Q. Yes, certainly. Approximately. I understood you to say there are some five or six thousand men engaged in the fishing industry down there. Does that include the men from both states?

A. Yes.

Q. That includes the entire number of men who are engaged in fishing in the waters of the Columbia River, whether citizens of Oregon, Washington, or elsewhere?

A. Yes sir, that is as I understand it.

Q. As I recall, the first name that you mentioned to whom you issued a license was Schoenebeck. That was for fishing down in Prairie Channel, was it?

A. Yes sir.

Q. And that is south of the boundary line as claimed by the State of Washington as shown on the map attached to our bill of complaint, is it not? Please examine the map which is attached
612 to the copy of the bill of complaint in this action. This line marked "Boundary line," in black ink, represents the boundary line as claimed by the State of Washington. I now desire to inquire of you if this license issued to Schoenbeck was for grounds or sands south of that line.

A. Yes sir.

Q. And which are not claimed by the State of Washington. I desire to inquire of you now with reference to a license issued to Tom Spencer for Spencer's Sands, and I will inquire of you if those sands are not also south of this boundary line as shown upon the map attached to our bill of complaint.

A. They are not shown on this map.

Q. Are not those Spencer Sands in Prairie Channel?

A. No, I think not.

Q. Where are they?

A. But I think they are close to the line that you designate here.

Q. It becomes of some importance, Mr. Van Dusen, to know whether they are north or south of that line. Have you any means of determining their location with reference to that line?

A. No, I don't think I have, not with reference to that line.

Q. You have not?

A. No.

Q. Is there any map here with which you are familiar that will show the location of the Spencer Sands? If so, I should be glad to have you examine it and testify from it.

A. This map of ours. (Pointing to a place thereon.)

Q. Just describe Spencer's Sands with reference to Oregon's Exhibit No. 8. How are they marked on that exhibit?

A. He has got two grounds; one of them is what they call the New Grounds, and this other is the Old Grounds. There are two Spencer Grounds. Does it make any difference?

613 Q. Just describe where they are, both of them, first. How are they marked on this map, Oregon's Exhibit No. 8?

A. The first one is marked "Thomas Spencer, 20.82 acres."

Q. How is the other marked?

A. The other is marked "Thomas Spencer, 25.99 acres, Y 24."

Q. Now, upon which one of these sands did you issue the license which you have referred to?

A. I issued both of them.

Q. You issued licenses to both of them?

A. Yes sir.

Q. Now, are you able to determine whether those islands are north or south of the boundary line as claimed by the State of Washington, as shown by the map attached to its bill of complaint?

A. I don't think I am.

Q. You are not able to determine that fact?

A. I don't think so.

Q. You issued two licenses to the Kaboth Sands. Those sands, I believe, are north of the line as claimed by the State of Washington?

A. They are north.

Q. Now, I desire to refer to the licenses which you issued to Kerseage, one of them on Barrel-Beacon sands. Please state whether or not Barrel Beacon sands are north or south of the boundary line as claimed by us, as shown on this map attached to the bill of complaint?

A. I couldn't state as to that.

Q. Those sands are south of the boundary line as claimed by us?

A. I don't believe that I could say whether they are or not, because I don't know just where your line runs.

Q. Here is our line, right here. (Pointing on map.)

A. Yes, but it does not show Barrel-Beacon and it does not show the Barrel-Beacon sands.

614 Q. Now, let us take up the license that was issued to Stensland & Sons. That was for sands in Prairie Island channel, was it not?

A. Yes.

Q. And that is south of the line as claimed by us?

A. Yes sir.

Q. Where are these Enyert & Cook Sands opposite Three Tree Point with reference to the boundary line as claimed by the State of Washington?

A. They are north of them.

Q. They are north of them?

A. Yes.

Q. Did you tell us in your direct examination where the Farrell sands are?

A. Wasn't that stricken out?

Q. I really don't recall.

Mr. ALLEN: Pardon me. The S. Farrell sands are above Three Tree Point. They must be a mile and a half above.

Q. The S. Farrell sands which you referred to this morning are up the river beyond Three Tree Point and not in the territory in controversy in this action; is that correct?

A. That is as I understand it.

Mr. ALLEN: There is an R. S. Farrell sands that are in this territory.

Q. There are other sands, I believe, known as the R. S. Farrell sands farther down the river and in the territory in dispute. You may state whether or not you have ever issued licenses upon those sands.

A. Not to my knowledge.

Q. Now, let us refer to the George W. Sanborn license, near Bay View. Do you know whether the sands upon which those licenses were issued were north or south of the boundary line as claimed by the complainant?

615 A. I think they are south.

Q. You think they are south?

A. This is your boundary line? (Referring to small map.)

Q. This is our boundary line as it is attached to the bill of complaint.

A. This is Sanborn's Fishertown sands, between Three Tree Point and Jim Crow Point.

Q. Is that north or south of the boundary line as claimed by Washington and shown on that map attached to the bill of complaint?

A. South.

Q. Miller's sands are north of that line?

A. Yes sir.

Q. And Barrel-Beacon, I think you stated a moment ago, you didn't know where it was?

A. It doesn't show on this map of yours.

Q. Walker's Sands are beyond Three Tree Point, up the river?

A. Yes sir.

Q. Where are the Johnson Sands with reference to the line as claimed by Washington?

A. The Johnson Sands are north.

Q. The Welch and Taylor Sands are also north, are they?

A. That I couldn't say, because I don't know the exact location of your line. They are northeast of Tongue Point and run off in here.

Q. What about Bowman's Sands? Have you during the adjournment, been able to ascertain their whereabouts?

A. No.

Q. Are they in the Cowlitz River?

A. I am not familiar with anything in Washington.

Q. Do you know where Henry's Sands are? Have you been able to ascertain their whereabouts?

A. No. I know a man by the name of Henry operates the

616 Oliver grounds. Whether you call them the Henry sands or not, I don't know.

Q. Well, I don't know either, Mr. Van Dusen. I am trying to ascertain.

A. Well, I don't know.

Q. What did you learn about Helgerson's sands during the intermission?

A. The Helgerson sands are the Fishertown sands.

Q. I wish you would describe to us the character of the licenses that you are issuing. Are they a roving license, so that a man can fish anywhere in the State of Oregon or Washington?

A. He would be privileged to fish anywhere in Oregon territory.

Q. Then, all your licenses are roving licenses; that is t. say, they

are available anywhere within the jurisdiction of the State of Oregon and the Columbia River?

A. Yes sir.

Q. What is your exact official title, Mr. Van Dusen?

A. Master Fish Warden.

Q. How long have you been Master Fish Warden?

A. Since March 7, 1901.

Q. And you have continuously perfomned the duties of that office since that time?

A. Yes sir.

Q. You know, do you not, Mr. Van Dusen, that during all this time the State of Washington has assumed to collect license fees for fishing and seining privileges upon all of these islands which are shown north of this boundary line as claimed by the State of Washington and as shown upon the map attached to our bill of complaint.

A. No sir, I do not—not of my own knowledge.

Q. Well, you know that there has been conflict between you as Master Fish Warden, and our State Fish Commissioner, and
617 that over a large number of these islands you have both sought and undertaken to collect for fishing licenses?

A. In other words, they have taken out Oregon licenses.

Q. And you also know they have taken out Washington licenses in a great many instances, don't you?

A. I don't think I ever saw one.

Q. Do you mean to say, Mr. Van Dusen, that you never heard of a Washington license being taken out for any part of the territory north of that line?

A. That is not what you asked me. You asked me if I knew they had. Now, I have never seen any of their licenses, but I have heard that they took out——

Q. Why, of course you have.

A. —Washington licenses, but I don't know of my own knowledge. Mr. Burton is here; he could answer that.

Q. Well, you have had frequent convesations and consultations with our State Fish Commissioner and our Deputy Fish Commissioner, have you not?

A. Yes.

Q. And in the course of these interviews the claims of the respective states to these fishing rights and the right of each state to collect for fishing licenses have been referred to, have they not?

A. Yes sir.

Q. And you knew that the State of Washington, through its Fish Commissioner, claimed the right to collect a license fee for fishing rights from fishermen in the Columbia River?

A. Well, I have a copy of their laws.

Q. Oh, I am not asking you about that Mr. Van Dusen.

The last question was read by the reporer.

Q. You knew that, didn't you?

A. Not over any territory that Oregon has complete control over.

Q. Certainly not. Let us get at it in another way. Do
618 you know whether the Fish Commissioner of the State of Washington exercises any jurisdiction over the Columbia River?

A. As to gill nets, we do.

Q. No, no, I say, the State of Washington.

A. Yes, as to gill nets; but as to seines and traps, they confine themselves to what they consider their territory.

Q. Well, what do they consider their territory?

A. Well, I don't know.

Q. Don't know that the State of Washington has issued licenses to Desdemona Sands?

A. No, sir, I don't believe they ever have.

Q. Don't you know that they have issued licenses to Miller's Sands?

A. No, I do not, of my own knowledge.

Q. Don't you know that they have issued licenses to Taylor's Sands?

A. As I told you before, I never have seen those.

Q. Well, you know some things, don't you, without seeing them?

A. I have been told.

Q. You say you don't know that Washington has issued licenses to these islands and sands that I have just referred to?

A. To the Desdemona Sands?

Q. No, the Taylor's, Miller's, Ryan's, Johnson's, and Oliver's.

A. I know nothing in that respect except what they have told me.

Q. That is what I want to know. What did they tell you?

A. I have been told that these men took out Washington licenses. I know they took out Oregon licenses, and have been told they took out Washington licenses.

Q. You knew there was a conflict, and that was the reason
619 you made this agreement which you have referred to with Mr. Burton?

A. Yes sir.

Q. And you knew that Mr. Burton, as Deputy Fish Commissioner, was claiming the right to exact these licenses from these fellows along this disputed portion of the river, didn't you?

A. Yes, I think so.

Q. You knew, didn't you, that Mr. Burton, as Deputy Fish Commissioner, had issued a license to McGowan and Grant, on the Hog's Back?

A. Yes, I was told so, and that was produced in evidence in a case.

Q. And it is a fact, is it not, that you caused the arrest of Mr. Grant for fishing on the Hog's Back contrary to the laws of Oregon in that he had not taken out an Oregon license?

A. Yes sir.

Q. And it is a fact that he was tried in the City of Astoria, is it not?

A. Yes sir.

Q. And it is a fact that he was acquitted by the court down there upon the ground that he did not have to take out a license under

the laws of the State of Oregon because the Hog's Back was in the State of Washington.

Mr. ALLEN: I don't think that is material. We object to it as not proper cross-examination.

Q. Is that not a fact?
A. I was not at that case.
Q. Well, he was acquitted, was he not?
A. He was acquitted.
Q. You caused the suit to be prosecuted, did you not?
A. Yes sir.
Q. You arrested him in person, did you not?
A. No sir.
Q. You caused his arrest, did you?
A. Yes.
620 Q. And he was acquitted on that ground, was he not?
A. I don't know.
Q. On what ground do you think he was acquitted?
A. That he had a license already.
Q. Did he have a license from the State of Washington?
A. From the State of Washington.
Q. He was acquitted, then, upon the ground that he had a license from the State of Washington?
A. Yes sir.
Q. And it was not necessary for him to take out a license in the State of Oregon?
A. That is as I understood it.
Q. And if it was not necessary for him to take a license out in the State of Oregon, it was because the property was not in the State of Oregon, wasn't it?
A. Not necessarily.
Q. Not necessarily?
A. No.
Q. That case was not appealed, was it?
A. No sir.
Q. The man was discharged?
A. The case was dropped.
Q. And did he subsequently take out a license from the State of Oregon for the same property?
A. Yes sir.
Q. He has taken it out now?
A. Yes sir.
Q. And also for the State of Washington?
A. Yes sir, pursuant to that agreement.
Q. That temporary agreement with Mr. Burton?
A. Yes; I think probably that is so.
Q. How many licenses have you issued to people on Sand Island?
A. Three or four.
Q. How long have you been issuing licenses to fishermen on Sand Island?

621 A. Why, in 1904, I think it was. It was 1904.

Q. Did you issue any licenses in 1905?

A. No sir.

Q. On Sand Island?

A. No.

Q. Nor in 1906?

A. No sir.

Q. Nor in 1903?

A. No sir.

Q. Or previous years?

A. No.

Q. Now, these licenses which you issued upon Sand Island, were they to citizens of the State of Washington or of the State of Oregon?

A. I couldn't say as to that.

Q. Those licenses would permit them to fish anywhere in Oregon territory on the Lower Columbia River, would they not?

A. Yes sir.

Q. They were not limited to Sand Island?

A. No sir.

Q. What kind of licenses were they?

A. Seining licenses.

Q. Did that license require them to stay in any fixed location?

A. No.

Q. Then, why do you say you have issued them to Sand Island?

A. Why, I designated the location where the gearing was to be operated. I have always done that.

Q. Does each license contain a designation as to where the seine shall be kept and maintained?

A. Yes.

Q. Is that under any provision of your law, or is that an action just taken by yourself?

A. Just by myself.

Q. A license that relates strictly to the State of Oregon would permit the holder of it to operate his seine anywhere in the Columbia River?

A. In Oregon territory—undisputed territory.

622 Q. Did you hear the testimony of Mr. Kershaw in which he said that he, as State Fish Commissioner, or his predecessor in office, had issued fishing licenses to fishermen and for fishing purposes to practically all of the sands shown north of this boundary line as claimed by the State of Washington, as shown by the map attached to the bill of complaint?

A. I was not in attendance when Mr. Kershaw testified.

Q. If he so testified you would not dispute that statement, would you?

A. No, I would not except to Desdemona Sands. If he said he had issued licenses to Desdemona Sands I would—No, if he said he had I would not dispute it, but I don't think that he did. Burton probably knows.

Q. Was not Desdemona Sands referred to in this agreement which you and Mr. Burton made?
A. Yes.
Q. Who got it?
A. Well, we got it and always had it.
Q. That arrangement contemplated that for that year and during the pendency of this controversy the State of Washington would simply withhold the exaction of licenses; wasn't that right?
A. Yes.
Q. In order to avoid double taxation of people down there?
A. That was the idea between the two of us.
Q. But Mr. Kershaw and Mr. Burton did not assume to relinquish any of the rights of the State of Washington to any of these, nor did you undertake to relinquish any claims of the State of Oregon to any of these sands you agreed to divide up?
A. I surely did not.
Q. And neither did the others?
A. I don't think so.
Q. You know they didn't?
A. I don't see why they would.
Q. And you know as a matter of fact they did not attempt
623 to do so?
A. I don't think they did, because we——

Redirect examination.

By Attorney General CRAWFORD:

Q. You may state about how many seining licenses you issue yearly.
Mr. MACDONALD: Where?
Attorney General CRAWFORD: The lower Columbia.
A. May I refer to my memorandum?
Q. I am not particular whether it is exact or not.
A. (After referring to memorandum.) 49 or 50.
Q. About how many trap licenses?
A. Two or three dozen.
Q. The trap licenses are for stationary fish-gear or apparatus, are they not?
A. Yes sir.
Q. Relative to the Alex. Grant case, you may state whether or not the jury did not find the defendant not guilty because the State of Oregon could not prove and did not prove in the case the fact as to whether the fishing was actually done in Oregon or in Washington.

Mr. MACDONALD: I object to that as leading.

A. Well, that was as I understood it. We did not prove to the satisfaction of the jury that the ground was wholly Oregon ground.

624 W. HAMPTON SMITH being duly sworn as a witness on behalf of the State of Oregon, testified as follows:

Direct examination.

Examined by Attorney General CRAWFORD:

Q. State your name, age and residence.

A. My name is W. Hampton Smith; my age is 69; I reside temporarily in Portland, but Astoria is my home and has been in the past.

Q. How long have you resided in Oregon?

A. Forty-six years.

Q. How long have you resided at Astoria?

A. I have been off and on at Astoria for ten or twelve years.

Q. In what year did you arrive in Oregon?

A. In 1860, the 1st day of August.

Q. And how old were you then?

A. Twenty-three years old.

Q. How did you come?

A. I came by the Steamer "Pacific."

Q. From where?

A. From San Francisco.

Q. Do you recollect coming over the bar at the mouth of the Columbia River and into the Columbia River?

A. Yes sir, very well.

Q. What vessel were you on?

A. I was on the Steamer "Pacific."

Q. What was the size of the vessel? Do you recollect the number of feet draught?

A. No; it was the largest vessel of that class of steamer at that time.

Q. You may state where she came into the river.

625 A. She came in close under Hancock or Cape Disappointment, right near shore, close. To me it looked as if I could throw a stone ashore. Of course, perhaps I could not do that. It was so close we could see the vegetation growing out of the rocks at the point ahead.

Q. And in coming in to the river did you pass north or south of Sand Island?

A. We passed to the north of Sand Island.

Q. Where did you land?

A. We landed at Upper Astoria and came in there; I don't know just the place exactly, but we stopped at Upper Astoria, at the customs house; it was then the customs house, kept by Col. John Adair.

Cross-examination.

By Mr. MACDONALD:

Q. Mr. Smith, at that time what was your business?

A. Well, my business was to get to Oregon at that time.

Q. What had been your business previous to that? Or I will ask you this: You are not a sea captain, are you?
A. No.

Mr. ALLEN: We don't offer this as expert testimony.

Q. What year was this?
A. 1860.
Q. Your testimony simply goes to the fact that you sailed close to Cape Disappointment and north of Sand Island?
Mr. ALLEN: Yes; the course the vessel took at that date.
Q. Do you know what the usual course pursued by ocean-going vessels at that time was, Mr. Smith?
A. Repeat that question, please.
Q. Do you know the usual course pursued by ocean-going vessels in coming into the Columbia River at that time?
A. Well, I understood only by the general talk, that we
626 came in at the regular channel.
Q. Of your own knowledge you don't know?
A. Nothing definite, no sir.
Q. Did you know that there was also at that time a south channel which came in and passed south of Sand Island?
A. I did not hear anything of that at that time; some ten years later I did.
Q. But you would not be prepared to say that there was no south channel at that time?
A. No, I couldn't say that. I was down in that country some ten or eleven years afterwards and they were then talking about a new channel that had been cut—what they called the south channel. I don't know when it was cut, or anything about it.
Q. Let me ask you how many times you had crossed the bar of the Columbia River in the first ten years of your residence in Oregon after you came in the time you mentioned?
A. I never crossed but once.
Q. You never crossed the bar but the one time that you have just testified to?
A. About ten years later I went down on one of the tugs to go out over the bar, but the bar was too rough and we didn't go out.
Q. Are you familiar with Sand Island and its movements to the northward?
A. Yes sir, in a general way. I have known about it ever since I have been in the country here.
Q. You know that Sand Island as it existed in 1868 has moved very much to the northward since that time?
A. Yes sir.
Q. And that it is now some three or four miles farther north than it was at the time you came in over the bar?
627 A. Well, I don't know as to the distance at all. I know it is not where it was.
Q. Approximately two or three or four miles?
A. I wouldn't positively say; I would say quite a distance.
Q. And don't you know as a fact, Mr. Smith, that the course

which you then pursued north of Sand Island would now be a course south of Sand Island as it exists at the present day?

A. My recollection of the island now, as we came in at that time, I would form the opinion or express the opinion that it would pretty near cut the island in two.

Q. It would cut the extreme southerly portion, would it not?

A. Well, I wouldn't think so.

Q. You wouldn't think so?

A. No. I don't remember that we bore to the north any after we came in.

Q. When you came in past Cape Disappointment or Cape Hancock, which is another name for the same point——

A. Yes.

Q. —your course then was southeasterly, was it not?

A. My recollection of it is that we came what I term or what we generally term nearly east for quite a little distance and then turned rather to the southeast.

Q. Are you familiar with the location of Fort Stevens?

A. Yes sir.

Q. After you passed the Cape and went to the easterly, you then bore in a southeasterly direction towards Fort Stevens, did you not?

A. No sir.

Q. Where did you bear to?

A. My recollection of it is we ran pretty near straight towards Astoria, in a southeasterly direction.

Q. Just look at this map, will you, please, Mr. Smith, Oregon's Exhibit No. 4; and I am pointing now to the most southerly
628 extremity of Cape Disappointment. I understand you to testify that your steamer came in so close to the point that I am indicating that you could almost throw a stone over?

A. Yes.

Q. You think after you got to that point you went in an easterly direction?

A. Yes, my recollection is we went east.

Q. And then you took a southeasterly course close to and nort- of Sand Island and down here towards Tansy Point up the river to Astoria?

A. No, my recollection of it is that we didn't come in here and come up.

Q. I don't think I made myself clear. Did you not take a cour- southeasterly from Cape Disappointment north of Sand Island and to the east of it, and then down this channel marked Clatsop channel past Tansy Point and on to Astoria?

A. I am quite confident we didn't come down to Tansy Point.

Q. Did you go close to Tansy Point?

A. I think not.

Q. Well, what course did you pursue?

A. My recollection of it is we came in almost from a northwesterly direction to opposite or a little below Astoria.

Q. Well, do you not observe here upon this map, Mr. Smith, that there are some signs marked "Bare at low water"?

A. Well, I see that now.

Q. It isn't possible your vessel crossed there, is it?

A. Well, I would hardly think so.

Q. I understood you to say that you were informed that your vessel followed the usual course at that time?

A. Yes. Of course I was just a passenger, you know.

Q. Yes. You paid no particular attention to it?

A. No, no particular attention to it. There is one thing that calls my attention to this. At Astoria, you know, along the foot hills, it was all timber; the whole peninsula was nothing but a
629 pile of immense forests and the lower foot-hills had been cut off, the timber had been cut away, leaving the bare poles of the standing timber, and it was remarkable to me it struck me forcibly.

Q. If sea captains and pilots who navigated the river at that time, and engineers who have examined closely the surveys made by the government at that time, testify that the usual course of sea-going vessels at that time was close to Cape Disappointment, then a little bit easterly, then southeasterly north of and very close to the east end of Sand Island, then down towards Fort Stevens, close by Tansy Point and up to Astoria, you would not say that they were incorrect, would you?

Mr. ALLEN: That is objected to as not proper cross-examination. That is a comparison of testimony, anyway.

A. No, I could not say that.

Q. You understood that your vessel was then pursuing the usual course?

A. I did.

Q. How large a steamer was it, Mr. Smith?

A. The steamer "Pacific" was the largest vessel running in here at that time. I don't remember how large she was. There were some 50 or 60 passengers of us and quite a lot of freight.

Q. Do you know what her draught was, how many feet of water she drew?

A. I don't think very deep; sixteen or seventeen feet perhaps.

Q. And came from San Francisco?

A. Yes. It was the largest in the regular line of steamers.

Q. It was a regular steamer running from San Francisco to Portland, was it?

A. Yes, at that time. "Bro. Jonathan" was, I think, the companion of her.

630 Q. You left her at Astoria, [illegible] you?

A. No, I came on to Portland.

Q. You continued on up the river?

A. Yes. I landed in Portland the 1st day of August 1860. Capt. Hiram Brown was the pilot from Astoria up; who the pilot was the other side I don't know.

631 JOHN H. LEWIS recalled as a witness on behalf of the State of Oregon, testified as follows:

Direct examination.

By Attorney General CRAWFORD:

Q. I believe when you were on the stand before you testified that you made the original tracing yourself from which was taken the blue-print introduced in evidence as Oregon's Exhibit No. 8.

A. Yes sir.

Q. And that you knew the original tracing to be correct.

A. It was taken, as I stated, from the government plat, and as shown by the note on the map is a State record, and is——

Q. Correct from those records?

A. Yes sir, I believe it is.

Q. You may state whether you have that original tracing with you.

A. The original tracing is here.

Q. Will you produce it?

The same is produced by the witness.

Attorney General CRAWFORD: The State of Oregon desires to substitute the original tracing in evidence in lieu of the blue-print marked Oregon's Exhibit No. 8.

Mr. MACDONALD: There is no objection to the substitution on the part of the State of Washington.

Attorney General CRAWFORD: I will ask that the original tracing be marked the same as Oregon's Exhibit No. 8, and the blue-print is withdrawn.

The tracing was so marked.

Q. Mr. Lewis, you may state whether you have examined the United States maps, which have been introduced in evidence, closely as to whether Sand Island has bodily changed its position since the year 1868, and, if so, state when you made those examinations and the result.

632 A. My statement with respect to the movement of Sand Island was based upon its position as shown upon the Government maps of 1868, 1885 and 1905, and the island shown by the lines representing ordinary low water.

Q. Now you may state whether the lines representing ordinary low water, as shown upon the maps to which you have referred, show Sand Island to have entirely moved from within those lines since 1868.

A. A small portion of Sand Island as it existed in 1868 is still within the lines as shown in 1905.

Q. You may state whether your examinations were carefully made in respect to that matter.

A. This comparison was made by tracing the relative locations and interposing them one upon the other by the local office of the Army Engineer, and by careful comparison I have verified these locations.

Q. And you are satisfied that they are correct, are you?
A. I believe them to be correct.

Cross-examination.

By Mr. MACDONALD:

Q. With what maps did you check up the delineation of Sand Island as shown upon this plat from which you have just been testifying?
A. With the maps as I have indicated.
Q. What are they?
A. 1868, 1885, and 1905.
Q. Now just refer to those by the exhibit numbers which have been given to them in this case. All of these maps, I believe, have been introduced in evidence.
A. No.
Q. Please examine the exhibits which have been introduced in evidence by the respective parties to this controversy, and
633 show me the maps from which this blue-print has been prepared.
A. This blue-print, as I stated, was prepared by the Army Engineers, and in their office I compared by placing the tracing over the maps as indicated, to know that they are substantially correct.
Q. Please examine the exhibits introduced by both parties to this action and tell me then from what maps that blue-print has been prepared.
A. The lines for 1868 representing Sand Island at low water are indicated on Oregon's Exhibit No. 9, as near as I can judge.
Q. Will you please examine it critically so that you may testify with absolute accuracy.
A. Without interposing a tracing over this map I could not swear positively, but it appears to be identically the same.
Q. I wish you would take some means of demonstrating that to a certainty.
A. It appears to be correctly shown upon this map by the lines which I am informed by the local Engineer's office represents Sand Island at ordinary low water.
Q. Upon Oregon's Exhibit No. 9 appears an island or sand — in the Columbia River, marked Sand Island. You observe hereon the exterior lines of that, do you?
A. I do.
Q. Now, those exterior lines do not conform and are not in the same position, nor do they indicate an island of the same size upon this plat from which you have just been testifying?
A. They do not.
Q. This blue-print, then, is not accurate?
A. This blue-print, from which I have been speaking to you as representing Sand Island, is Sand Island at ordinary low water.
Q. Is it not Sand Island at extreme low water?
634 A. I am informed by the Army Engineers it is ordinary low water.

373

Q. You don't know of your own knowledge what that line indicates?

A. No sir.

Q. You are basing your testimony upon what these Army officers tell you?

A. Yes sir.

Attorney General CRAWFORD: They are engineers, aren't they?

WITNESS: It is the man in charge of the office.

Q. What is his name?

A. Hedley.

Q. Is Mr. Hedley an officer of the corps of engineers of the United States Army?

A. He is an employé.

Q. He is simply a draughtsman down in that office, isn't he?

A. Yes sir.

Q. And not an engineer. What I desire to direct your attention to, so that it may clearly appear in the record, is this: You observe around Sand Island the exterior line shown in very marked black coloring?

A. Yes sir.

Q. Now, that does not conform in size or position with the line upon this blue-print——

A. It does not.

Q. —which assumes to represent the island, and the area at the same time, as does this Oregon's Exhibit No. 9?

A. I am speaking of Sand Island at ordinary low water.

The question was read, and Mr. Macdonald asked that it be answered Yes or No.

A. It does not represent the same area.

Q. The Middle Sands, as shown upon Oregon's Exhbit No. 9, are connected at low water with Sand Island, are they not?

A. The Middle Sands appear to be an extension of Sand Island, no soundings from the map being given. Let me correct that.

635 Q. All right.

A. Except in the Northern part of Sand Island, where I notice a depth of 2 feet, 6 feet, and others.

Q. This exterior line which appears to be around this island named in Oregon's Exhibit No. 9 as Sand Island, delineates the surface which is exposed at high water, does it not?

A. The heavy lines represent the surface exposed at high water.

Q. And the lines which appear on this blue-print as showing Sand Island, delineate the island as it appears at low water?

A. Yes sir.

Q. Now that disposes of the 1868 map. What was the next one?

A. 1885.

Q. Will you be kind enough now to examine the map introduced in evidence which shows the hydrography or survey of 1885 from which this blue-print is taken?

A. Such a map does not appear to have been introduced in evidence.

Q. Will you be kind enough to refer to the map of 1905 which has been introduced in evidence.

A. It is Oregon's Exhibit No. 6.

Q. Will you kindly compare the lines?

A. The lines appear substantially correct in the main.

Q. They are not absolutely the same, are they?

A. By interposing these tracings it is quite probable that the shore lines which I have just compared may not be as exactly shown, but the point which was placed in common when the comparison was made was the light-house as indicated on the map.

Q. Will you kindly observe the exterior lines, in black, of Sand Island as shown on Oregon's Exhibit No. 6, and compare them with the line as shown on this blue-print? You observe that they
636 are not at all similar, and they are not alike or identical.

A. No sir.

Q. The black line enclosing Sand Island, as marked on Oregon's Exhibit No. 6, I assume delineates Sand Island as it was exposed at high tide; am I correct in that?

A. Yes, I assume it is.

Q. And the lines which appear on this blue print assume to delineate Sand Island as it is exposed at low tide?

A. That is the intention.

Q. Would you be good enough to tell me what this most southerly dotted line appearing on this blue print to enclose a sand or island, indicates, and which is marked L. W. line U. S., C. S. 52. I assume that "U. S., C. S." means United States Coast Survey of 1852.

A. Yes.

Q. Do you know what these letters "L. W. line" indicate?

A. That means low water line.

Q. Do you know what sand or island that is supposed to represent?

A. That is supposed to represent Sand Island in 1852, as indicated by low water line.

Q. Please let me direct your attention to this dotted line immediately north of the one to which we have just referred and which is marked "L. W. line U. S. C. S. '68," and I will ask you to tell me if you know what that assumes to portray.

A. That is intended for the low water line surrounding Sand Island at that date.

Q. Now, no portion of Sand Island at low water in 1852 would touch Sand Island as shown at low water in 1868?

A. No sir.

637 Q. The next dotted line above the 1868 hydrography is that mark- "U. S. Engineers Department, 1885;" do I understand that that assumes to show Sand Island as it existed in 1885?

A. Yes sir.

Q. At low water?

A. At low water, as I understand it.

Q. Are you prepared to say that lines showing Sand Island in

1868 at high tide and Sand Island at high tide in 1885 would encroach upon each other?

A. I am not.

Q. You don't know whether they would or not.

A. I do not.

Q. You have not made sufficient examination to be able to testify positively upon that point?

A. No sir.

Q. Are you able to testify from any examination which you have made that the lines of Sand Island at high water in 1868 would encroach upon the lines of Sand Island at the present time either at low or high water?

A. I judge that it would not.

Q. Then, I understand from that, that Sand Island, as it existed at high water in 1868, is not in any position occupied by the present Sand Island at either high or low water?

A. As indicated on Oregon's Exhibit No. 9 in heavy black line, which I understand represents the high water line, it is not in any position which is occupied by the island as shown in 1905.

Mr. MACDONALD: General Crawford, I should like very much to further cross-examine Mr. Lewis upon testimony which he has heretofore given.

Attorney General CRAWFORD: Certainly.

638 Q. I desire, Mr. Lewis, to have you refer to Washington's Exhibit H, assuming that the State of Oregon was admitted into the sisterhood of states in 1859, what is the nearest hydrography to that date published by the Federal government of the entrance to the Columbia River?

A. The hydrography as shown on Washington's Exhibit H, does not show the hydrography nearest to the date in question.

Q. What is the nearest hydrography to the date in question?

A. Do you refer to that later or prior?

Q. I want the nearest hydrography as published by the government of the entrance to the Columbia River, to the date of the admission of Oregon.

A. It is shown on Oregon's Exhibit No. 4, dated 1851.

Q. Isn't the hydrography of 1852 nearer to 1859 than that of 1851?

A. The nearest hydrography for the bar is as shown on Oregon's Exhibit No. 5?

Q. What is the date of that?

A. For 1854.

Q. Well, now, you have stated that the hydrography as shown on Washington's Exhibit H was not the nearest date. I think you must be mistaken in that, Mr. Lewis, and I will ask you to compare Oregon's Exhibit No. 5, which you say is the hydrography nearest to the date of the admission of Oregon, with the hydrography as platted upon Washington's Exhibit H, and called the 1854 hydrography, and see if it is not accurate, and which appears on Washington's Exhibit H in orange tint.

A. I assume that you refer to the official certified copy, but as it has been re-platted in orange with red dotted lines surrounding, from a hasty examination I should judge that it was correctly shown.

Q. In order to get this straight: Assuming that this hydrography enclosed in red dotted lines and tinted in orange is an ac-
639 curate and exact reproduction of the hydrography contained on Oregon's Exhibit No. 5, it would then show the hydrography of the entrance nearest the date of the admission of Oregon?

A. It would, yes sir.

Q. In the determination of your initial point for the boundary line as claimed by the State of Oregon, will you please state what hydrography you had in mind?

A. It was the hydrography as shown upon the map of latest date which was at that time that shown upon the map in Oregon's cross-bill.

Q. And that was of what date?

A. Published at Washington, D. C., 1905.

An adjournment was here taken until the morning of Thursday, July 26, 1906, at ten o'clock, when the witness was recalled and his cross-examination resumed, as follows:

Q. Then, in fixing that boundary line as claimed by the State of Oregon, you acted upon the hydrography latest in publication by the Government?

A. Taken to be the latest, yes sir.

Q. You did not, then, use the hydrography of 1852 or 1868?

A. I used the channels which corresponded nearest to the channels as shown upon the map of date nearest to the admission of the state and prior to the admission.

Q. Did you attempt to follow ship channels as they existed in 1852 or 1868 in drawing this line which is claimed by Oregon as the boundary line?

A. I attempted to follow what remains of the channel as it existed on these maps which were the latest prior to the admission of Oregon.

Q. Can you show me on any map a ship channel which
640 ever passed as far north as your line as claimed in Baker's Bay, for instance?

A. I doubt if this can be done, but the channel has shifted northerly.

Q. Is it not a fact, Mr. Lewis, that the ship channel never passed as far north as shown by the blue line which delineates the boundary line as claimed by Oregon on Washington's Exhibit H.

A. I assume that it did not.

Q. Is it not a fact that the red line marked "north channel line 1854" on Washington's Exhibit H, depicts the most northerly ship channel ever used on the river so far as can be ascertained from the charts and reports published by the Federal government?

A. The red line which you have mentioned appears to indicate about the center of the north ship channel of the Columbia River as extended into the ocean for some distance beyond a line drawn be-

tween Cape Disappointment and Point Adams, and then apparently follows the middle of the north ship channel of the Columbia River, passing into the south ship channel of the Columbia River as shown upon the map of 1854; but upon the map, Oregon's Exhibit No. 5, the hydrography is not fully presented and it might be possible for ships to enter coming from the north passing close to Cape Disappointment and into the north ship channel of the Columbia River.

The question was read by the reporter and the witness answered as follows:

A. It probably represents the ship channel which would be shown on Oregon's Exhibit No. 4, entering the Columbia River,
641 but, as I stated before, on Oregon's Exhibit No. 5, it might be possible to enter from the north passing close to Cape Disappointment.

Q. Well, take that channel inside of Cape Disappointment; doesn't that line which I have just referred to indicate the most northerly ship channel that was ever used by ocean-going vessels so far as you can gather from an inspection of the maps and documents published by the government?

A. It does not.

Q. Tell me, then, what channel was ever used as a ship channel which was north of that line as shown on Washington's Exhibit H. I will confine my question, Mr. Lewis, to a point east of Cape Disappointment.

A. For a short distance the red line on Washington's Exhibit H, marked "channel line 1854" represents the most northerly channel which I would assume ships followed at that date; but from the examination of the channels as indicated in green dotted lines it would appear that the most northerly channel would be that following close to the State of Washington instead of——

Q. Mr. Lewis, I want to confine my remarks to the channel that was actually used by ships, and not the deepest water in spots; but a well-recognized channel used by ocean-going steamers in going up the river.

A. It is impossible for me to say what channel was actually used, except judging from these maps and as stated this channel appears to be fully as good as the south channel, judging from the map.

Q. Take the most northerly point on that 1854 channel line, shown on Washington's Exhibit H, and tell me if you can find
642 that a channel north of that was ever used by ocean-going steamers or vessels.

A. Judging from the channels as shown on Oregon's Exhibit No. 9, it would appear that the ship channel of the Columbia River passed some distance farther north than the line in question; perhaps other maps or charts might show the channel passing farther north.

Q. What is the date of the hydrography of Oregon's Exhibit No. 9?

A. It is marked 1868.

Q. And the red line which you have just referred to as indicating

the north channel line is the line that was put on there by Captain Wood from memory, is it not?

A. I do not know as to that, but it appears to follow close to the deepest water as shown on this map.

Q. If the channel line shown on Oregon's Exhibit No. 9, goes to the north of the north channel line, as shown on Washington's Exhibit H, it is but a short distance north and a short distance laterally.

A. Yes sir.

Q. And follows the same channel a little bit to the eastward?

A. A little bit to the eastward.

Q. I wish you would tell me again—you have already testified, but I would like to inquire of you again the method by which you arrived at the initial point of your boundary line, as claimed by Oregon.

A. The initial point is the point at the angle of the blue line out in the ocean, as shown on Washington's Exhibit H, and is intended to be one marine league due west and opposite the middle of the north ship channel of the Columbia River, which point is at the east end of the straight line and which point is on a line
643 adjoining the nearest points on Cape Disappointment and Point Adams, respectively, and in the middle of the deepest channel as shown upon this map.

Q. Now, this channel line marked "north channel line 1854" indicates the course pursued by ocean-going steamers and the north ship channel as of that date, does it not?

A. I am unable to say as to that, for it might have been possible to come in from the north close to Cape Disappointment.

Q. What leads you to believe that it might have been possible to do that?

A. For the reason that the hydrography is not complete.

Q. Then, the fact that the soundings and the hydrography is incomplete there leads you to believe there may have been a channel?

A. Yes sir.

Q. Is there anything in the sailing directions to indicate that was the channel?

A. I do not see anything to that effect by a hasty examination.

Q. What map are you examining?

A. The sailing directions on Oregon's Exhibit No. 5.

Q. Well, do those sailing directions not show that there was a north and a south channel across the bar of the Columbia River?

A. Yes sir.

Q. And do not those sailing directions which appear on Oregon's Exhibit No. 5 show the channels north and south as reproduced on Washington's Exhibit H, delineated in red ink?

A. What is marked as the north channel, yes sir.

644 Q. And there appears nothing, so far as you can find, which indicates that there was a channel into the river north of the one marked "north channel line 1854" on Washington's Exhibit H?

A. I see 4½ fathoms written near the word "breakers," which leads me to believe that it might be possible to come in from the north.

Q. There is nothing however, to indicate that that was the channel customarily used at that time?

A. No sir.

Q. And from aught that appears upon these charts and maps the two channels which actually were used by deep sea vessels were the two shown in red ink on Washington's Exhibit H?

A. Yes sir.

Q. Then, you assumed that the middle of the north ship channel was the eastern point of this blue straight line projected in from the ocean under which the word "boundary" appears, below and west of Cape Disappointment?

A. Yes sir.

Q. You did not take into consideration, nor did you consider that the north ship channel went farther south and out into the ocean as shown by the red line marked "north channel line 1854"?

A. It is clearly apparent that the north ship channel of the Columbia River continues on into the ocean beyond this point, which I assume is the mouth of the Columbia River?

Q. What do you consider to be the mouth of the river?

A. It is a line drawn between a point on Cape Disappointment and Point Adams which are nearest to each other, respectively.

Q. Do you consider as a general rule that the mouth of a
645 river is shown by a line drawn connecting the headlands nearest to the sea?

Mr. ALLEN: I suppose I might interpose an objection there, on the ground that that is assuming to state a legal proposition.

Mr. MACDONALD: We have a right to know what he conceives to be the mouth of a river.

Mr. ALLEN: It is objected to as incompetent, irrelevant, and immaterial. Each river's mouth is dependent upon it's own condition.

A. I have taken this to be the mouth of the Columbia River for the reason that beyond these points the land recedes in every direction, and except for the technical description as shown near the top of Washington's Exhibit H, which I assumed was placed there merely to fix this line more definitely for mariners, perhaps without regard to the exact definition of the word.

Q. Mr. Lewis, I would like to get a direct answer to my question.

The question was read by the reporter.

A. Connecting some points on the headlands nearest the sea, yes sir.

Q. You would consider a line drawn from Cape Disappointment to Point Adams as defining the mouth of the Columbia River notwithstanding the fact that there may have been shoals and sands beyond that confining the ship channels?

A. Yes sir.

Q. Would it, then, make no difference in your determination of what the mouth of the river was, whether there were islands out

here, or sands, or the fact that there were well-defined chan-
646 nels westwardly and seaward from this line joining these two points?

A. These islands would be in the ocean.

Q. And these sands would be in the ocean?

A. Yes sir.

Q. You are familiar with the improvements which have been made by the Federal government out there?

A. I have heard something of them and see——

Q. Then, according to your definition of the mouth of the river, all these improvements are out in the Pacific Ocean and not in the Columbia River.

A. Part of them would be.

Q. Part of them are in the Pacific Ocean?

A. Yes sir.

Q. If the course delineated on this map as the north channel line, 1854, were the one used by ocean-going steamers and vessels as of 1852, would you still consider the mouth of that channel to be intersected by a line drawn from Cape Disappointment to Point Adams?

A. Yes sir, at that time, provided you have reference to the channel in the Columbia River.

Q. You would not consider, then, the mouth of this channel to be the point where it joins the ocean?

Mr. ALLEN: You mean the point where the river joins the ocean?

Mr. MACDONALD: The point where the channel joins the ocean.

A. If the hydrography upon this map, Washington's Exhibit H, were continued farther into the ocean, you might find this channel continuing indefinitely.

Q. Oh, just answer my questions, Mr. Lewis; that is not
647 an answer to it.

A. The mouth of the north ship channel of the Columbia River would be where this channel passes into the ocean.

Q. And that would be at a point where the confining influences of sands or islands cease to exist and where a mariner could roam at will.

A. No sir.

Q. Assuming the hydrography of 1852 to be correctly reproduced on Washington's Exhibit H, as shown by these red lines and circling orange coloring, do you not consider that that north ship channel extends exactly as shown by the red line marked "north channel line 1854"?

A. I assume that it is approximately correct as far as it goes.

Q. Now, I ask you, Mr. Lewis, assuming that it is correct. For the purpose of my question assume that it is correct, and then answer my question.

A. Yes sir, as far as the hydrography is shown upon this map.

Q. And again assuming for the purpose of my question that the hydrography of 1852 is correctly reproduced on Washington's Exhibit H, the mouth of this ship channel would then be at the inter-

section of those two red lines, respectively marked "1 marine league due west" and "north ship channel 1854"?

A. No sir.

Q. Where would it be?

A. It might be many miles farther in the ocean providing the hydrography were shown.

Q. You think it might be farther in the ocean?

A. Yes sir.

Q. But it would not be farther up the river, would it?

648 A. I am speaking now with reference to this channel marked "north channel."

Q. Certainly. I say, then, the mouth of that channel would not be farther up the river but it might be farther seaward?

A. Yes sir.

Q. And this point here at the intersection of those two red lines is the point shown as the entrance to that channel by the sailing directions as published on Oregon's Exhibit No. 5, approximately.

A. Yes sir, approximately.

Q. Now, as I understand you, you established your initial point as shown at the extreme west end of the straight line below Cape Disappointment under which the word "boundary" appears. How did you arrive at the remainder of the line from your initial point?

A. By passing up the river from this point, following as near as possible in the deepest water of what remains of the north ship channel of the Columbia River, to and up the middle channel.

Q. Now, just wait a minute before you go any further. There never was a ship channel as far north as the northerly part of this line appearing in Baker's Bay, was there?

A. I said what remains of the north ship channel of the Columbia River.

Q. Oh! Then the depths of the water at the present time in that channel north of Sand Island and Baker's Bay are what determines you upon this line so far as it appears in Baker's Bay?

A. Yes sir.

Q. And it was not the depths as they existed in 1852.

649 A. It was not.

Q. Did the same rule govern you in determining that line up the river beyond the northerly part of Sand Island?

A. Yes sir.

Q. And the same rule governed you all the way up?

A. Yes sir.

Q. You do not pretend to say, Mr. Lewis, that this blue line shown there by you represents an actual course that was ever pursued, or represents in an entirety an actual ship channel ever used?

Mr. ALLEN: That is objected to as incompetent, irrelevant and immaterial.

A. I am unable to say as to this point.

Q. Well you are able to state, are you, Mr. Lewis, whether you undertook to follow any ship channel which was actually ever used?

A. I undertook to follow what remains of the ship channels which were actually used as shown by the earlier maps.

Q. And taking the present depths?

A. Yes sir.

Q. Now, ships do not use a course which is shown by that blue line at the present time, do they? I mean ocean-going vessels coming in from the sea and going to the upper river points.

A. It would depend upon the depth of these ocean-going vessels,—the draught.

Q. Are you prepared to say that it would be possible at low tide for any vessel that goes on the Pacific Ocean to come into the Columbia River and proceed up that river on a course which was shown by your blue line?

A. Not at low tide, but perhaps at high tide—depending upon the draught of these vessels.

650 Q. I ask you, at low tide.

A. Perhaps not at low tide.

Q. Don't you know, as a fact, that it is not possible?

A. If you would describe what you mean as an ocean-going vessel, perhaps I could answer you.

Q. An ocean-going vessel is a vessel that goes to the ocean.

A. Of what depth?

Q. Of any depth.

A. A vessel of 4 feet draught perhaps could get through this channel and proceed to the ocean at low water.

Q. At low water?

A. Yes.

Q. Just examine your line there carefully and tell me if it does not show there in one place a depth of only 1 foot at low water.

A. This line is approximately in the middle of the channel, and by following approximately close to this it appears that a vessel of four feet draught at low water might get through.

Q. Is it not a fact that your line goes in water of only 1 foot in depth, as shown on this map?

A. At the point you refer to, the line was placed approximately in the middle.

Q. Oh, now, Mr. Lewis, just answer my question, won't you please?

A. It goes close to what is marked as "1 foot."

Q. And in one or two places the nearest depths indicated are 1 and 2 feet?

A. Yes sir.

Q. Now, then, just let me ask this question, and I think you can answer it yes or no. Would it be possible for an ocean-going vessel to come into the Columbia River and proceed up the river upon a course which would be shown by your blue line on Washington's Exhibit H?

651 A. No sir.

Q. You made some reference, Mr. Lewis, to a notation which appears on Washington's Exhibit H, reading as follows: "Lines dividing the High Seas from Inland Waters relating to Rules of the Road." Isn't it a fact that that notation on there is for the purpose of marking a boundary line between the rules and regula-

tions pertaining to the navigation of deep seas and also to the rules and regulations pertaining to the navigation of inland waters?

A. I assume that it is.

Q. And you are aware of the fact, are you not, that the rules are different for navigation of the ocean and the navigation of inland waters?

A. I assume that they would be.

Q. And that the signals are different and the equipment is different, as required by the Federal rules and regulations?

A. I am not conversant as to that point.

Q. Well, you understand that to be the fact, don't you?

A. No sir, I do not.

Q. And that this notation here is simply the point of demarkation where the ocean rules and the inland rules are applicable?

A. I assume that it is.

Q. And that is not for the purpose of defining what the government conceives to be the mouth of the river?

A. It is not.

Q. Now I desire, Mr. Lewis, to direct your attention to Washington's Exhibit I. Can you tell me from an examination of charts and maps what the direction of the current of the Columbia River is at the most easterly point shown upon Washington's Exhibit I?

A. It would be down the river.

652 Q. Beg your pardon?

A. I say the direction of the current would be down the river.

Q. Certainly. Give me the direction—north, south, east or west direction.

A. In a westerly direction.

Q. Due west?

A. It depends which channel you refer to; the northerly and widest channel would be in a northwesterly direction.

Q. The channel, then, as it comes upon Three Tree Point is running in a northwesterly direction?

A. At Three Tree Point marked on this map it is running a little southwesterly.

Q. Take it a little bit east, then, of Three Tree Point. Take it at the extreme end of these lines marked "1905 channel line" and the blue line marked "Boundary line as claimed by Oregon," which meet at the extreme eastern part of the river shown on this map, and tell me in which direction the current is flowing at that point.

A. Westerly, referring to true meridians.

Q. Now what would be the natural course of that current after it strikes the north shore of the river?

A. It would be westerly perhaps.

Q. And would not the current naturally be deflected from the Washington shore down to what is known as the Woody Island channel?

A. I would judge so if it were not for the presence of Woody Island.

Q. Well, the natural tendency would be to go in a southwesterly direction, would it not?

A. I would judge a little north of southwest.

Q. Generally speaking, it would naturally be deflected in that direction, wouldn't it?

653 A. Yes sir.

Q. By its contact with the north bank here?

A. Yes sir.

Q. Do you know where Pillar Rock is?

Attorney General CRAWFORD: You mean by your question, do you, that it would be deflected a little south of west?

Mr. MACDONALD: Yes.

A. I see Pillar Rock written on the map.

Q. We will assume that is correct. Do you know anything about the dredging which has been done by the Federal Government in the vicinity of Pillar Rock?

A. I do not.

Q. Assuming for the purposes of my question that dredging has been done in the vicinity of Pillar Rock, between the Rock and the Washington shore, what, in your opinion, would be the effect of that with reference to the channel?

A. I would judge that it is to deepen the channel and to get into the main land.

Q. It would have the effect of bringing the channel nearer to the Washington shore than it would flow in its natural state?

A. I am uncertain as to whether this is the main channel or whether it would have any effect whatever on the main channel.

Q. Assuming that the channel in its natural condition would run from Three Tree Point to that part of the 1905 channel line where the figures "1905" first appear west of Three Tree Point—I say assuming between those two points that the channel in its natural course would follow the blue line, and subsequently considerable dredging was done between Pillar Rock and the main land, would that not have the effect of bringing the channel closer to the Washington shore?

A. It would depend entirely upon the nature of that dredging.

654 Q. Well, suppose considerable dredging was done there. You understand by dredging, the excavation of earth from the bottom of the river, don't you?

A. Yes sir

Q. And if the river is made deeper the water will naturaliy flow into it, won't it?

A. Provided it gets down as far as the dredging is done.

Q. Suppose that it gets down to the point where it was done, the water would naturally flow in where it was excavated?

A. If it was excavated.

Q. If they did any dredging there, it would naturally result in a greater volume of water coming in, wouldn't it?

A. It depends upon the nature of the dredging. If — is simply a channel into the main land from the main channel perhaps no additional water would flow into it.

Q. Would it be possible to dredge in any part of the river there, excavate a considerable quantity of sand and earth, and it not result in getting more water in it?

A. You would get more depth of water.

Q. Certainly. What do you understand to be the channel of a river?

A. It would the space between the banks or between the islands above or below water through which part of the river flows.

Q. Would it not be that portion of a river where the main current flows and which is the deepest and best and safest for passenger vessels?

A. The safest channels would be such as you have described.

Q. And these minor channels cannot be considered as ship channels at all?

A. It would depend upon your definition of ships.

655 Q. Well, you wouldn't call every channel in the Columbia river a ship channel, would you?

A. Every channel through which a ship of any character could pass would be a ship channel, depending upon the draught.

Q. Now, each one of these channels crossing the bar of the Columbia River has what is known as a throat or gorge, has it not?

A. I assume that it would have. I am not familiar with the definition of these terms.

Q. You say you do not understand what throat or gorge of a channel is.

A. I am not familiar with the definition of these terms.

Q. Do you know that as a susual proposition the mouth of a channel is some distance from its throat or gorge, seaward, of course.

A. I would assume that it is.

Q. I want to talk to you a little bit, Mr. Lewis, about this Middle Channel. As I recall the description of the boundary line, it reads: Commencing at a point one marine league due west and opposite the north ship shannel of the Columbia River, thence easterly to and up the Middle Channel, etc. Will you kindly designate the most westerly point of what you conceive to be the Middle Channel referred to in that description.

A. The latest map prior to the admission of the State of Oregon shows the hydrography approximately as indicated in green upon Washington's Exhibit H, and passing inland from the ocean it is clearly apparent from this hydrography that there is a north channel and a south channel at Astoria, and nothing to indicate a middle channel between Astoria and Point Ellice. But east of this

656 line it appears that there is a channel following close to Cliff Point on the Washington shore, and one beginning a little east of Point Ellice and passing south of this northerly channel, and also a channel near Astoria. There are indications of deep water, however, between Point Ellice and Astoria, but nothing to indicate that ships could in any way get in to this channel; that is, ships of the depth capable of passing through the other three channels mentioned.

Q. Now, in drawing this blue line, Mr. Lewis, did you undertake to go up what you considered to be the middle channel?

A. What remains of the middle channel as shown upon the latest map prior to the admission of Oregon.

Q. You took the location of what you considered to be the middle channel when it existed and then took the deepest depths in that channel as they exist today; is that it?

A. Yes sir.

Q. Now, just describe, if you will, please, the location of that middle channel as you believed it to exist at the date of Oregon's admission to the Union.

A. It would begin a little east of Point Ellice, passing easterly to near the star at the north end of the pointer indicating true north on the map, Washington's Exhibit H; thence northeasterly as referring to the hydrography as shown in green.

Q. Is it not a fact that there were two or more channels south of that at that time?

A. Passing in from the ocean there was only one channel south of that at that time.

Q. Wasn't there a channel which appears to be going
657 through the center of this compass shown on Washington's Exhibit H?

A. There appears to be deep water in that space, but no indications as to its continuing on towards the ocean.

Q. Now, let me inquire, Mr. Lewis, whether or not this channel which you designated as the middle channel, was a continuous channel from the ocean up the river at the date of Oregon's admission to the Union and a channel which could be used and was used by ocean-going *going* vessels of deepest draught.

A. From all indications an ocean-going vessel of considerable draught could pass up the middle channel which I have referred to at the date of its publication; and I am unable to find any map of similar date showing the continuation of this channel, but assume that it must have continued in order to admit the water necessary to scour and make this channel as shown.

Q. What is the date of the hydrography nearest to Oregon's admission upon that portion of the river shown on Washington's Exhibit I?

A. It is 1867 and 1868.

Q. Does that hydrography show a continuation of this middle channel, on Washington's Exhibit I, of sufficient depth to admit of the passage of ocean-going steamers?

A. It would depend upon your definition of draught.

Q. Well, take it of the deepest draught, then.

A. Will you please state what depth you mean?

Q. Take ocean-going vessels of the deepest draught. Or, if you prefer, you may state the condition of that channel and the draught of vessels which could proceed through it.

A. The shoalest point I observe in this line which is supposed to represent what Oregon claims and is marked upon this map as the "boundary line as claimed by State of Oregon," is 11 feet at low

water; at high tide, I am informed, a vessel drawing 6 or 7
658 feet additional of water could pass through this channel.
But I notice this blue line passes near the figure 9, which is apparently somewhat north of what is shown as the boundary line upon the map, in Oregon's cross complaint.

Q. Mr. Lewis, would you consider, then, the governing or ruling depth of that channel to be 9 feet or 11 feet.

A. I would consider it in the channel as marked on Oregon's cross-bill, to be 11 feet at low tide or about 17 feet at high tide, as shown by the hydrography of 1867 and 1868.

Q. How wide would such a channel be? I mean by that, how wide would your channel be with a ruling depth of 11 feet?

A. It would be of sufficient width to admit any vessel that could pass over it with safety.

Q. What is a sufficient width to permit any vessel to pass through a channel?

A. I am judging with reference to other channels as shown on this map, and it appears fully as wide, if not considerably wider, than that as shown in red near the southwest corner of this map, near where it is marked "1859" in red.

Q. What is the depth there at the last point you have designated?

A. The depth at this point is considerably greater, but I am referring to the width.

Q. Would not the fact that the water is very much deeper make the channel safer and better and easier to follow?

A. It would make it safer provided you follow in the deepest water.

Q. Now, going back to the middle channel, does that appear to be a well defined channel, as shown upon Washington's Exhibit I, in its entirety?

A. It would so appear, speaking of channels of this ruling depth.

Q. Would you consider it as the best defined channel in
659 that portion of the river shown in Washington's Exhibit I?

A. The best-defined channel would, of course, be the deepest channel.

Q. And this middle channel is not the deepest nor the best defined channel in that portion of the river?

A. It is not the deepest channel at present.

Q. Was it then?

A. I can't say as to that point.

Q. Are you not able to answer my question from an examination of the hydrography of that date?

A. I had reference to the continuation of the middle channel as shown on Washington's Exhibit H, marked in green, and there being no hydrography of that date extending up the river beyond, that is shown.

Q. What is the earliest hydrography, let me inquire again, of that portion of the river shown on Washington's Exhibit I.

A. It appears to be as shown on Washington's Exhibit I, marked 1867 and 1868.

Q. Are you able to tell me from an examination of that hydro-

graphy which was the best, deepest and best-defined channel in that section of the river at that time which is reflected in Washington's Exhibit I? Would it not be approximately the red line shown on Washington's Exhibit I, marked "1859 channel line" which passes through Woody Island Channel?

A. It would not.

Q. Where would it depart from the line marked "1859 channel line" on Washington's Exhibit I?

A. To make it of what depth?

Q. Well, I asked you if the line marked "1859 channel line" in red ink does not approximately and fairly indicate the best-defined ship channel as of that date.

660 A. I said it does not.

Q. Wherein does it not do so?

A. Near the word "line" written in red, I notice the figure "5" indicating, I assume, five feet in depth, and the ruling depth in the blue line is intended for 11 feet as shown on Oregon's cross-bill.

Q. What do you understand this figure 5 at the word "Line" to indicate?—Feet or fathoms, and of what hydrography is it?

A. I take it to be five feet, judging from the note marked "soundings."

Q. Now, of what date is that depth shown?

A. Of the hydrography of 1867 and 1868.

Q. Doesn't Washington's Exhibit I show that there has been a re-survey of a very much later date?

A. There is marked here "Re-surveyed main channel to buoy No. 14."

Q. Washington's Exhibit I shows there has been a re-survey of the main channel to buoy No. 14, in 1885 and 1889, does it not?

A. Yes sir.

Q. Then, this ruling depth of 5 feet which you have just referred to, is not the depth as of 1867, is it?

A. I assume that it is, for the reason that if the main channel passed through that point in 1885 and 1889, the depth would be greater.

Q. Do you understand that that figure 5 there, concerning which you have been testifying, indicates the depth at that point in 1867?

A. I believe it to be. My idea is that this reference to re-survey means the marking by buoys, although I am not certain as to that.

Q. Do you think the main channel in the Columbia River

661 would run five feet of water?

A. I believe that in 1885, if that was the main channel, it would have been either scoured out or dredged out to produce the necessary depth, but 5 feet as indicated there refers to the depth of some date which I have taken to be 1868.

Q. You are not positive as to that?

A. I feel quite sure as to that.

Q. Do you observe here certain buoys marked 1, 11, 13, 15, 9, 10, 2, 12?

A. I do.

Q. Do you know of what date they appear on here?

A. I do not know of what date they appear.
Q. Have you any means of ascertaining?
A. I have not.

(Recess until 2 o'clock.)

Q. Now, Mr. Lewis, again referring to the 1859 channel line, as delineated on Washington's Exhibit I, in red ink, I will ask you if that does not correctly show the ship channel as it existed at that time, as of the hydrography of 1867 and 1868.

A. It represents a very poor channel line as of the hydrography of 1867 and 1868, for, as previously stated, near the line in red appears the figure 5, representing 5 feet depth at low water.

Q. You think, then, that that line does not indicate the channel as it existed in 1867 and 1868?

A. It would represent a channel of depth as indicated by the figures on the map near the line shown in red.

Q. Just answer the question please, Mr. Lewis.

The question was read by the reporter.

A. You say *the* channel?

662 Q. I mean, the main ship channel.

A. It would indicate a very poor ship channel.

Q. Can you tell where the ship channel was from Astoria up the river in 1867 and 1868?

A. The main channel from Tongue Point on Washington's Exhibit I, as shown by the hydrography, appears to be from a point a little north of Tongue Point northeasterly in almost a straight line to Gas Buoy or near the intersection of the blue and the black line.

Q. Of what year are you speaking?

A. With reference to the hydrography as shown upon Washington's Exhibit I?

Q. What is that?

A. It is marked "hydrography 1867 and 1868."

Q. Don't you know, as a matter of fact, that that channel never was used until a long period after that and after it had been dredged by the Federal government?

A. I am speaking with reference to the soundings on this map, and have no knowledge of the——

Q. Then, I understand you to testify here that the main ship channel in that portion of the river shown by Washington's Exhibit I is not shown by any of the lines on that map.

A. Will you state to me what you mean by the "main channel"?

Q. I want the main ship channel, the channel that is used by the steamers in coming and going from Portland to the sea.

A. I have no knowledge as to what channels were used.

Q. You don't know, then, what the main ship channel was in 1867?

A. Other than as interpreted from the figures of soundings shown upon this map.

663 Q. Are you prepared to say that the channel line which we have marked there in red ink, "1859 channel line," is not correct?

A. I have no means of determining whether it is correct or not.
Q. Then you don't know whether it is correct or not?
A. I do not.
Q. And you will not testify that it is incorrect?
A. I cannot.
Q. If our engineers testify it is correct, you would not dispute them, would you?
A. Without having some map——
Q. Just answer that, yes or no, Mr. Lewis. You can make any explanation you want to on redirect examination, but that question calls for an answer, yes or no.
A. I could not.
Q. And if witnesses called by the State of Oregon, such as Captain Wood, testify that that is the course which was pursued by ocean-going vessels in coming up the river from the sea, you would not dispute them either, would you?
A. I could not.
Q. And you would not?
A. It would depend upon the existence of maps showing the hydrography of that date.
Q. Well, are you in possession of any knowledge gained from any maps which would justify you in disputing the correctness of that line?
A. I have addressed a letter to the——
Q. Now, never mind; I didn't ask you that. I want a direct response to the question.
A. Can I speak of knowledge with reference to the maps?
664 Q. Anything that you have ever seen or read about.
A. I have addressed a letter to the Superintendent of the U. S. Coast Survey, requesting maps showing the condition of the channel near the mouth of the Columbia river which were of the latest date prior to 1859, also those of soonest date thereafter, but have as yet found no map showing the hydrography of 1859 in this territory near the mouth of the Columbia river.

The following question was then read by the reporter:

Q. Are you in possession of any knowledge gained from any maps which would justify you in disputing the correctness of that line?
Mr. MACDONALD: Answer that question, Mr. Lewis, please. It calls for an answer, yes or no.
A. Yes sir.
Q. What is the information you say you have which justifies you in disputing the accuracy of that line?
A. It is the lack of a map showing the hydrography of this date, which I have endeavored to secure.
Q. Then, you say this line is incorrect because you have no documentary evidence to show its accuracy; is that it?
A. That I could not certify to its accuracy or inaccuracy for lack of this documentary evidence.

Redirect examination.

By Mr. ALLEN:

Q. Mr. Lewis, I wish you would take Washington's Exhibit H, which is the composite map of the mouth of the river and the vicinity, and reading you the description first of the initial point of what is claimed in Oregon's cross-bill to be the boundary line of the State of Oregon, which occurs in these words: "A point due west and opposite the middle of the north ship channel of the Columbia river," tell me, if you please, how far distant seaward the initial point designated on Washington's Exhibit H as that claimed to be
665 the initial point of the description of Washington's boundary, is from the first point designated, or from the headlands of the mouth of the river as you claim it to be.

A. It is approximately 5 nautical miles southwesterly from the light on Cape Disappointment.

Q. How far is it from the nearest point on a line drawn from Cape Disappointment southerly to Point Adams?

A. It would be approximately the same distance, for the line from the point mentioned to the light is very nearly at right angles to the line you have just mentioned between these points.

Q. Make an examination of the same character and ascertain if you can, please, how far distant in a straight line the western extremity of the line designated on Washington's Exhibit H as "1 marine league due west" is from Point Adams on the Oregon main line. That is, in a straight line from point to point.

A. It is a little over 7½ miles from a point on Point Adams to Cape Disappointment as scaled on this map.

Q. From an examination of this map, what is the character of that portion of what Washington claims is the mouth of the Columbia River which is west and outside of a line drawn from Cape Disappointment to Point Adams, as shown on Washington's Exhibit H?

A. It would appear that the point designated as the middle of the channel from which the line drawn, marked "1 marine league due west" is a point in the north ship channel of the Columbia river extended into the ocean as shown by the hydrography as indicated with dotted red lines colored in yellow, which, if more fully developed might show the extension of this channel some considerable distance farther into the ocean?

Q. How far (making the same examination of this plat
666 designated as Washington's Exhibit H), is that point which is designated as the intersection of the line marked "north channel line" with the line marked "1 marine league due west" from the lighthouse on Cape Disappointment?

A. It is approximately 2¾ nautical miles.

Q. In which direction?

A. Southwesterly from the lighthouse.

Q. Are you familiar with the location of the Columbia river jetty as shown on this map?

A. Not other than as shown and marked "jetty" upon Washington's Exhibit H.

Q. I wish you would please examine Washington's Exhibit H and the scale thereon, and give me the length of that jetty from Point Adams seaward?

A. It is approximately 4¾ nautical miles as scaled on this map.

Q. How far is it from the western extremity of that line designated as "jetty" on Washington's Exhibit H, to the line designated on said Exhibit as the western extremity of the red line marked "1 marine league due west"?

A. Nearly 3½ nautical miles.

Recross examination.

By Mr. MACDONALD:

Q. What is the difference between a nautical mile and a statute mile.

A. I do not know as to the exact distance in feet, but my reference has been made to the scale as printed upon Washington's Exhibit H.

Mr. ALLEN: My questions referred to the scale on the map.

Q. You say that the hydrography might show the extension of that channel further into the ocean than is shown on Washington's Exhibit H?

667 A. If it was developed to a greater distance.

Q. Look at the hydrography of 1852, and tell us what that shows.

A. To which of these Oregon exhibits do you refer?

Q. I have not in mind the one that shows the hydrography of 1852 beyond the bar, but I want you to examine that one, and tell me what it shows with reference to depths.

Commissioner REYNOLDS: I think it is Oregon's Exhibit No. 5.

Q. That is the hydrography of 1852, published in 1854, and which has been constantly referred to in our testimony as the hydrography of 1854. It is shown in Oregon's Exhibit No. 5, is it not?

A. As shown on Oregon's Exhibit No. 5, the hydrography of 1852, we find printed "North channel" which passes in water deeper than 18 feet.

Q. What I want to get at is this, Mr. Lewis, to be brief about the matter: Is there anything upon the map, Oregon's Exhibit No. 5, which justifies you in stating that the channel is extended farther eastward than is shown upon Washington's Exhibit H, I mean the north ship channel.

A. No contours other than the 18-foot are shown, but the depths are marked upon this map——

Q. I want you, Mr. Lewis, to give us the depths in prolongation of the north ship channel as it is shown upon our map. I don't want you to select isolated spots either to the north or south of it.

A. On Oregon's Exhibit No. 5, westward from the intersection of

the lines, in what is printed "north channel" we find 6¾, 5¾, 6½, fathoms, and 7½, going southerly.

Q. What is the depth of that channel before it leaves the sands which appear in Washington's Exhibit H orange tinted?

A. The depth would be as printed in red, inside of the intersection of the various red lines, 27, 30, 30, 33, 34, 27, 36,
668 22, 40, and so on.

Q. And at the intersection there are 24 feet, are there not?

A. Yes sir, marked so.

Q. Now, these sands confined within the dotted red lines and tinted in orange or yellow are within the 18-foot contour lines, are they not?

A. They are supposed to be, yes sir.

Q. Do you find any prolongation of that north channel seaward in depths of 18 feet or less?

A. The water gets deeper, apparently.

Q. And there is nothing to indicate upon that map or from the hydrography of 1852 that there are any shoals seaward from those shown on Washington's Exhibit H?

A. Nothing, that I notice.

Q. Then, there is nothing to show that that channel is extended further seaward than appears on our Washington's Exhibit H?

A. If the 5-fathom contour line on the bottom of the ocean were drawn, it would show by coming in nearer to the intersection of the two lines on Oregon's Exhibit No. 5, near the mouth of the channel, marked "north channel," that a fairly well-defined channel extended a little farther into the ocean.

Q. Is it confined within any sands of 18-foot depth or less?

A. Such a line would mark the intersection with the sands on the bottom at 5 fathoms in depth.

Q. That is 30 feet, isn't it?

A. Yes sir.

Q. That is the shoalest spot that you are able to find, is it,—30 feet?

A. I was speaking with reference to this line as indicating
669 an extension of the channel, the same as the 18-foot line indicates the channel, by coming in near the entrance.

Q. Assuming an imaginary line connecting these two sands within the 18-foot contour in yellow at the most westerly point, what is the least depth that you are able to find seaward in that? Do you understand what I mean?

A. Yes.

Q. I want the hydrography of 1852.

A. On Oregon's Exhibit No. 5, we find the shallowest depth marked immediately west of the center of this line is 4¾ fathoms, near the northerly end of the line, 3¾ fathoms, and near the southerly end of such a line 4¼ and 4¾ fathoms.

Q. If a jetty be constructed by the Federal government eastward from Cape Disappointment, what effect would it have upon the present ship channel as shown on Washington's Exhibit H, marked 1905 channel line?

A. I believe it would tend to deepen the channel.

Q. What effect, in your opinion, would it have upon the location of the present 1905 channel line as depicted on this map?

A. That would depend upon the direction and location of the jetty.

Q. Assuming that the jetty be constructed in such direction that its extreme seaward end would be, say, two miles from the end of the present jetty on the Oregon side.

A. I do not think that it would materially change the location of the channel.

Q. Do you know what is the prevailing direction of the littoral currents in the Pacific Ocean in the vicinity of the mouth of the Columbia River?

A. I know nothing whatever except by hearsay.

670 Q. The Japan current passes close to the Pacific Coast near the mouth of the Columbia River, doesn't it?

A. I have heard that it does.

Q. And it passes in a northerly direction, does it not?

A. I am not conversant with the direction of the current.

A. M. CRAWFORD being duly sworn as a witness on behalf of the State of Oregon, testified as follows:

I wish to testify that my name is A. M. Crawford; that I am the duly elected, qualified and acting Attorney General of the State of Oregon; that I am defending this suit for and on behalf of the State of Oregon in my official capacity as such Attorney General, and that as such officer it is my duty to appear and defend the State of Oregon in all cases to which she is a party or wherein she may be interested, and to set up all and any defenses and rights she may have in the premises.

No cross examination.

Stipulation.

It is hereby stipulated and agreed by and between the parties hereto that this suit was instituted under the direction of the Governor of the State of Washington in pursuance of legislative enactment by the Legislature of the State of Washington during its sessions of 1905; and it is further stipulated that in the event the Supreme Court of the United States shall not approve of this stipulation and shall hold that proof is insufficient to show that this

671 was instituted by the proper authority of the State of Washington, a continuance may be had to obtain further testimony on that point.

It is also further stipulated that this suit is defended by the Attorney General of the State of Oregon, and that he is authorized by the laws of said state, and it is made his duty, to appear and defend all suits in which the State of Oregon is a party or is interested, and to set up and maintain all defences and rights which said state may have therein.

Stipulation.

It is hereby stipulated and agreed by and between the parties hereto that the signature of witnesses to the testimony taken before the respective Commissioners of the parties shall be and is hereby waived, and the testimony of the witnesses of both parties when extended from stenographic notes into typewriting and duly certified by the Commissioners hereto shall be taken and accepted as though actually signed by the witnesses.

672 Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Certificate of Shorthand Reporter.

UNITED STATES OF AMERICA,
State of Oregon, County of Multnomah, ss:

I, the undersigned, do hereby certify that I was appointed by the respective parties to the above-entitled cause to report the testimony and proceedings therein; that I was present at the examination of all of the witnesses on behalf of the defendant, as herein set forth; that I made in shorthand writing a complete and accurate report of the proceedings and of the testimony of all of such witnesses, and that the foregoing pages are a complete and accurate transcript of my shorthand notes therein.

ROB'T S. TAYLOR.

Dated at Portland, Oregon, August 1, 1906.

673 Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Commissioners' Certificate.

UNITED STATES OF AMERICA,
State of Oregon, County of Multnomah, ss:

I, C. C. Dalton, and I, John W. Reynolds, do each hereby certify that said C. C. Dalton is a Notary Public duly commissioned by and for the State of Washington, and said John W. Reynolds is a Notary Public duly commissioned by and for the State of Oregon.

That both of us, the said C. C. Dalton and John W. Reynolds, have been, in pursuance of stipulation herein, duly agreed upon and appointed by said States of Washington and Oregon, respectively,

by their respective attorneys, as Commissioners jointly to take the testimony of the witnesses in the above entitled cause and to certify the same jointly to this Honorable Court.

That each of us before proceeding to take the testimony herein, duly took and subscribed an oath to support the Constitution of the United States and faithfully and impartially to discharge our duties as such Commissioners, which oaths are herewith filed.

That the foregoing depositions of witnesses on behalf of the defendant were taken before us jointly as such Commissioners on oral interrogatories, between the hours of ten o'clock in the forenoon and four o'clock in the afternoon, on the dates and at the places
674 following, respectively:

Deposition of John H. Lewis, on July 11, 1906, and July 12, 1906, at Astoria, in Clatsop County, State of Oregon;

Deposition of H. P. Kindred, on July 11, 1906, at Astoria, Clatsop County, State of Oregon;

Deposition of P. E. Ferchen, on July 11, 1906, at Astoria, Clatsop County, State of Oregon;

Deposition of M. D. Staples, on July 11, 1906, at Astoria, in Clatsop County, State of Oregon;

Deposition of A. C. Fisher, on July 11, 1906, at Astoria, in Clatsop County, State of Oregon;

Deposition of Peter Jordan, on July 11, 1906, at Astoria, in Clatsop County, State of Oregon;

Deposition of John Pickernell, on July 11, 1906; at Astoria, in Clatsop County, State of Oregon;

Deposition of John H. Lewis, (recalled) on July 12, 1906, at Astoria, in Clatsop County, State of Oregon;

Deposition of Robert Carruthers, on July 12, 1906, at Astoria, in Clatsop County. State of Oregon;

Deposition of C. S. Gunderson, on July 12, 1906, at Astoria, in Clatsop County, State of Oregon;

Deposition of A. Montgomery, on July 12, 1906, at Astoria, in Clatsop County, State of Oregon;

Deposition of A. E. Beard, on July 12, 1906, at Astoria, in Clatsop County, State of Oregon;

Deposition of George W. Wood, on July 24, 1906, and July 25, 1906, at the Portland Hotel, in The City of Portland, Multnomah County, State of Oregon;

Deposition of G. G. Brown, on July 24, 1906, at Hotel Portland, City of Portland, Multnomah County, State of Oregon;

Deposition of H. G. Van Dusen, on July 25, 1906, Hotel Portland, City of Portland, Multnomah County, State of Oregon;
675 Deposition of John H. Lewis (recalled), on July 25, and July 26, 1906, at Hotel Portland, City of Portland, Multnomah County, State of Oregon;

Deposition of W. Hampton Smith, on July 25, 1906, at Hotel Portland, City of Portland, Multnomah County, State of Oregon;

Deposition of A. M. Crawford, on July 26, 1906, at Hotel Portland, City of Portland, Multnomah County, State of Oregon.

That said depositions and testimony so taken were reported in shorthand writing by Robert S. Taylor, the shorthand reporter duly agreed upon and appointed by the respective parties to said cause to report said testimony, and were by said Robert S. Taylor, under our direction, reduced to typewriting, and the certificate of said Robert S. Taylor as to the correctness thereof is thereunto appended.

That before proceeding to report said testimony said Robert S. Taylor was by us duly sworn to report and transcribe the same truly, faithfully and correctly.

That before said testimony was taken, each of said witnesses was by us duly sworn to tell the truth, the whole truth and nothing but the truth.

That the reading and signing of said depositions by the respective witnesses was duly waived by stipulation of the parties hereunto by their respective attorneys, which said stipulation is set forth in the record of said depositions.

That Exhibits were introduced in evidence on the part of said defendant and marked as follows, said marks being authenticated by our signatures as Commissioners, to-wit:

Oregon's Exhibit No. 1,
Oregon's Exhibit No. 2,
Oregon's Exhibit No. 3,
Oregon's Exhibit No. 4,
Oregon's Exhibit No. 5,
Oregon's Exhibit No. 6,
Oregon's Exhibit No. 7,
676 Oregon's Exhibit No. 8,
Oregon's Exhibit No. 9,
Oregon's Exhibit No. 10,
Oregon's Exhibit No. 11,
Oregon's Exhibit No. 12,
Oregon's Exhibit No. 13.

That Exhibits marked Oregon's Exhibit No. 10, Oregon's Exhibit No. 11, Oregon's Exhibit No. 12 and Oregon's Exhibit No. 13, have been copied and set forth in the record of testimony, and it was duly agreed and stipulated by the parties hereto, by their respective attorneys, that said copies in said record may stand for and in the place of the original exhibits so marked.

That the foregoing are all of the exhibits offered or introduced before us on the part of said defendant, and said exhibits Oregon's Exhibit No. 1 to Oregon's Exhibit No. 9, inclusive, are hereto attached and made a part hereof.

That the foregoing is a true and complete transcript of the depositions and evidence taken before us on behalf of the defendant in the above entitled cause, and of the whole thereof, and of all objections made thereto, and of the stipulations entered into between the parties during the progress of the taking of the testimony on behalf of the defendant, and consists of pages numbered 1 to 296 of the record of testimony taken before us in said case.

In witness whereof, we have hereunto subscribed our names and

affixed our notarial seals this 4th day of August, 1906, at The City of Portland, Multnomah County, in the State of Oregon.

[NOTARIAL SEAL.] C. C. DALTON,
Commissioner and Notary Public for the State of Washington.

[NOTARIAL SEAL.] JOHN W. REYNOLDS,
Commissioner and Notary Public for the State of Oregon.

677 In the Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Record of Testimony on Behalf of State of Oregon.

By mutal agreement and consent of the parties the taking of testimony in the above entitled case was resumed this 13th day of September, 1906, at the Portland Hotel, Portland, Oregon, the State of Washington appearing by E. C. Macdonald, Assistant Attorney General of the State of Washington, and George W. Allen, Esq.; and the State of Oregon appearing by A. M. Crawford, Attorney General of the State of Oregon, Honorable Harrison Allen, District Attorney, and A. M. Smith, Esq., of counsel.

It is mutually stipulated that the taking of testimony be and the same is hereby opened for the purpose of taking additional testimony on behalf of both parties.

It is further mutually stipulated and agreed that John H. Pelletier shall act as reporter to take the testimony in shorthand and reduce the testimony of each witness to writing; and that the actual signing of the testimony by each witness is hereby expressly waived.

It is further stipulated and agreed that the said John H. Pelletier shall take and subscribe the usual oath before proceeding to take the testimony, and that said oath be attached to the testimony as extended.

The respective parties hereto hereby pray that the Supreme Court approve this stipulation.

678 John H. Pelletier was duly sworn to truly, faithfully and correctly report in shorthand writing and transcribe into typewriting the testimony and proceedings.

Thereupon the following proceedings were had and the following testimony was offered and received, to-wit:

GELO F. PARKER being duly sworn as a witness on behalf of the defendant, testified as follows:

Direct examination.

By Mr. CRAWFORD:

Q. Mr. Parker, please state your name, age, residence and occupation.

A. My name is Gelo F. Parker; my residence is Astoria, Oregon; my age is 52, occupation, surveyor.

Q. You are a civil engineer, are you?

A. Yes sir; surveyor and civil engineer.

Q. How long have you resided in Astoria or in the vicinity of the Columbia river?

A. I have resided in Astoria since September, 1874.

Q. You may state, Mr. Parker, whether you made a survey of what is called Kaboth sands in the Columbia river and located that on chart No. 2 of the Columbia river as prepared by the United States Engineers.

A. I made a survey of these Kaboth sands on September 3rd of this year and since then have platted that survey on the chart you name.

Q. You may state whether you have that chart with you or not.

A. I have the chart here.

Q. Will you produce it?

A. (Witness produces a chart.)

Q. Is this the one (indicating)?

679 A. Yes sir.

Q. You may state whether Kaboth sands located on that map are correctly located and if so how you know they are.

A. The sands, according to the survey which I made on the 3rd of this month, are shown on the map in red. They were located by running a base line upon the sands at low tide and triangulating to the three points shown on the map.

Q. Name them.

A. One is marked "Cold Storage at Altona." "Wharf at Charlton," "Cold Storage, location not named, but at Pillar Rock."

Q. You know that to be correct, do you?

A. It is correct, the survey and plat of the same.

Q. You may state how far it is from the sands to the Oregon shore, if you know.

A. To the Oregon shore is about——

Q. Across Woody Island Channel?

A. It is about half a mile to the Oregon shore.

Q. State about how far it is from the sands to the Washington shore.

A. To the Washington shore, the nearest point is about a mile and three-quarters.

By Mr. MACDONALD: Do I understand you to say it is half a mile from here to the Oregon shore?

A. To the Oregon shore, to this shore, the United States meander covered that ground.

Q. What do you mean by the Oregon shore?
A. By the Oregon shore I mean the shore which is included within the United States meanders in sectionizing the Oregon country.

Mr. CRAWFORD: The State of Oregon offers said map in evidence for the purpose of showing the location of Kaboth sands, and asks that the same be marked Oregon's Exhibit No. 14.

680 The same was marked Oregon's Exhibit No. 14, and signed by the Commissioners.

Mr. MACDONALD: The State of Washington has no objection to it.

Q. You may state whether said map shows the Woody Island and Cordell channels.

Mr. MACDONALD: We admit that it does. This is from 6141, isn't it?
Mr. CRAWFORD: Yes, it is from No. 6141.
Mr. MACDONALD: We admit that plat correctly shows Woody Island channel and Cordell channel.

Q. You may state whether it is all water between the sands and the Washington shore at the present time?
A. It is all water between the sands and the Washington shore.

Cross-examination.

By Mr. MACDONALD:

Q. When you say that Kaboth sands are half a mile from Oregon, you don't mean the main land, but you mean, as I understand, the nearest sands south of Kaboth?
A. I mean to the land which is nearest.
Q. That is not the main land?
A. It is not high land, it is low land.
Q. And between that low land and the Oregon main land there are other channels, are there not, such as Prairie channel?
A. There is the Prairie channel between.
Q. So the Kaboth sands are more than half a mile from the Oregon main land?
A. Yes sir, if you term the high land the main land, it is.
Q. You don't term that intervening country between Woody Island channel and Prairie channel main land, do you?
A. Well, I don't pretend to define that.

Q. You don't term it the main land do you; you see on
681 that map, don't you, that Prairie Channel is a well-defined channel apparently, from that map, between that and Woody Island Channel, there appear to be islands or sands there.

A. That is from the islands. It may not be termed main land.
Q. And you know, as a matter of fact, that the Oregon main land is away to the south of that, and that there are even channels south of Prairie Channel, and sloughs.
A. There are sloughs, yes.
Q. And therefore it is not the main land, is it?
A. It may not be termed main land.
Q. South of Prairie Channel, there appears to be Long Island,

Blind Slough, Prairie Channel extended, and other channels not named or denominated before you reach the main land, isn't that the fact?

A. It is, sir.

Q. Have you taken any surveys of the depth of water between Kaboth sands and the Washington main land?

A. No, I have not.

Q. Have you taken any surveys of Woody Island Channel or Cordell Channel at the present time?

A. No sir; I have not.

Q. Do you know whether Cordell Channel is now open to navigation, that is, the channel north of Snag Island?

A. No, I don't know anything about the channels.

Q. Do you know whether Woody Island Channel, being the channel south of Snag Island, is open to navigation?

A. I think it is only open to very small vessels.

Q. When did I understand you to say you made this survey of Kaboth sands?

682 A. The 3rd of this month, the 3rd of September.

Q. Did you state in your testimony the area of those sands?

A. No sir, that I have not computed.

Q. Did you make an actual survey of the distance to the Washington mainland?

A. I did.

Q. And what did you say that was?

A. The distances are all shown to these definite points, the distances.

Q. The distances that you marked on the map?

A. Marked on the map.

Q. To the triangulation lines?

A. Yes sir.

By Mr. A. M. SMITH:

Q. Mr. Parker, what is the character of the soil on the islands that are across Prairie Channel towards Oregon to these Kaboth sands south?

A. A portion is covered with grass, parts of them are covered with willows, and spruce trees.

Q. Is it higher than ordinary tide flats?

A. Higher, oh yes, yes.

Q. Higher than ordinary seining ground, isn't it?

A. Yes, they can't be used for seining.

Q. Covered with vegetation?

A. Covered with vegetation.

Q. That country has been sectionized, you say, do you?

A. Yes sir.

Q. By the Government, and been platted by the Government?

A. Yes sir.

683 Q. And is there any channel of the Columbia river south of the Prairie Channel?

A. Nothing but a slough south of it and——

Q. There is no continuous channel, other than blind sloughs, are there?

A. No sir; no other.

Q. And Prairie Channel is the south channel of the Columbia river, as far as being a channel is concerned?

A. Yes sir.

Recross-examination.

By Mr. MACDONALD:

Q. Did you make a personal investigation of the character of these sands south of Woody Island channel and Kaboth sands?

A. They are not termed "sands," they are,—it is a country covered with vegetation.

Q. What do you term them, islands?

A. Islands.

Q. Are those islands natural islands or are they an alluvial deposit?

A. I could not state the formation of them.

Q. You did not make a sufficient investigation to determine that question, as I understand it, then?

A. I am not a geologist, no.

Q. Did you make an investigation or examination of Kaboth sands to determine whether they are natural ground or alluvial deposits?

A. I could not state the origin of those. I have been on the sands, but I did not see that formation. I was not there before the sands were there, and I know nothing about the formation of them,
684 only I supposed that it was deposited by the tides and currents of the river.

Q. Is the Columbia river a silt-bearing stream?

A. Yes sir.

Q. Have you had occasion to investigate into that subject?

A. I have, to some extent, yes sir.

Q. What is the area of the Kaboth sands, so far as you can approximate it at this time?

A. Probably some 75 acres.

Q. Is there any vegetation thereon?

A. None whatever.

Q. What is the character of the vegetation on the islands south of Woody Island channel?

A. It is grass, ordinary grass, which grows from low land, where it is grassy, and willows and spruce trees.

Q. What other trees are there?

A. There are some alders and some other brush that I don't know the names of.

Q. Did you make any particular investigation or examination to determine the age of those trees?

A. No, I have not. Some of the timber, though, is quite old.

Q. How did you determine that fact?

A. Well, the size of the tree would indicate the age, in a measure.

Q. Did you reach a conclusion in your own mind as to the age of any of that timber?

A. No, I have not examined it for that purpose, but there are trees there which are undoubtedly 75 or a hundred years old.

Q. How did you determine that fact?

A. From knowing the age of trees in other localities which
685 I had counted the growth, the rings.

Q. How do you determine the age of the trees?

A. Counting the ring which is formed annually, in the growth of the tree.

Q. Did you cut down any trees to determine the number of rings?

A. Not in this place.

Q. You did not there?

A. No sir.

Q. It is purely a guess on your part as to the age that that timber might be?

A. That is all.

(Witness excused).

686 JOHN SERVICE being duly sworn as a witness on behalf of the defendant, testified as follows:

Direct examination.

By Mr. A. M. SMITH:

Q. Mr. Service, will you state your name, age, occupation and place of residence?

A. Forty five, occupation fisherman.

Q. And your residence?

A. Astoria.

Q. How long have you been engaged in the fishing business?

A. Since 1883.

Q. What fishing business have you conducted?

A. Well, in later years I have been seining. When I first commenced fishing on the river I had a gill net.

Q. Are you familiar with the ground known as the Kaboth ground?

A. Yes sir.

Q. And how long have you been familiar with it?

A. Since I have been on the river, since '83.

Q. How long have the grounds that are now known as the Kaboth grounds been above the ordinary low water, or how long since they emerged as tide lands?

A. Well, these grounds as they are now, were built in the freshet of '94, I believe.

Q. Were they formed at that time?

A. Yes sir, these grounds.

Q. Did you ever live in that neighborhood?

A. Yes sir.

687 Q. When did you live there?

A. Lived there in '83 and from that on for about 10 years continuously.

Q. From '83?
A. Yes.
Q. Now, Mr. Service, did you ever have occasion to fish in the Woody Island Channel or the Cordell channel?
A. I used to fish there entirely.
Q. What was the length of the net that you used?
A. 300 fathoms, about 1800 feet.
Q. Did you ever drift through the Cordell channel?
A. Yes sir.
Q. About how often would you drift through that channel during the fishing season?
A. Well, probably two or three trips each day, sometimes down the Woody Island channel, sometimes down the Cordell channel, wherever we thought that we would get the most fish.
Q. Mr. Service, will you state which channel was the wider channel when you first become acquainted with those channels, the Woody Island channel or the Cordell channel?

Mr. MACDONALD: Will you fix the date more definitely, please, before Mr. Service answers the question?

Q. (continued:) Say, between '83 and '89 and '90, which was the wider channel, the Cordell channel or the Woody Island channel?
A. The Cordell channel.
Q. Which was the deeper channel?
A. Why, there was one or two little spots in the Woody Island channel that was deep, but take the channel right through, I think the Cordell channel was the deepest, in fact, I am sure it was,
688 although, you understand me, there was some places in the Woody Island channel that was deep, and is today.
Q. How much wider was the Cordell channel during that time than the Woody Island channel?
A. It was about one third wider.
Q. Which channel at that time was used by the boats navigating that part of the Columbia river, the Cordell channel or the Woody Island channel?
A. There was neither one of them used at that time.
Q. Neither one of them used at that time?
A. No sir, not by vessels, only small boats.
Q. Which channel was used by vessels?
A. Why, the channel as it is today, with the exception of Pillar Rock there. There is a little change at Pillar Rock.
Q. Which channel was that?
A. That is the north channel as they call it.
Q. The north channel?
A. Yes, the deep channel as it is today, with the exception of a change there at Pillar Rock. They formerly ran in south of Pillar Rock. Now they go north. That is the only change.
Q. How long have they used this channel for commerce, ship navigation, to your knowledge?
A. Since I remember it, since I have been on the river they have

always used it. As I say, with the exception of little gasoline launches, or something like that.

Q. Did you ever know of any ships being taken through the Woody Island channel or the Cordell channel since you have been on the river?

A. It is impossible.

Q. What is the character of the Woody Island channel with reference to depth for navigation?

689 A. It is very hard to get through, it is hard to get through.

Q. With what kind of boats?

A. With small boats, even with a gasoline boat you have to be very careful in going through.

Q. And what is the character of the north channel down the Washington shore, that you speak of, with reference to navigation?

A. It is deep, with the exception of at Pillar Rock there is little shoals at Pillar Rock.

Q. What is its character with reference to width and volume of water?

A. It is the widest channel the main channel, it covers the largest body of water.

Q. Just describe the course of that channel from Jim Crow Point to Tongue Point, referring to this map, Washington's Exhibit I?

A. It passes Jim Crow Point on the south and leaves in a westerly direction passing Pillar Rock on the north, thence in a general westerly direction to the north of Miller sand,——

Q. Where the figures "1905" are?

A. Where the figures 1905 are, passing to the north of the gas buoy, to the north of No. 2 beacon, passing to the north of No. 3 beacon, and to the south of this red light, the piling on the sands it is, that has got a light on it, a red light, I don't know what they call it, and it then turns a little to the north towards Taylor's Sands, passing to the south of that, it runs then in a general direction into the O. R. & N. Company's dock.

Q. At Astoria?

A. Yes, in Astoria.

690 Q. Is that the channel that is designated on the Washington's Exhibit I as the 1905 channel?

A. Yes sir.

Q. Now, has that been used continuously as a channel of commerce for ships since '83?

A. With the exception of some small changes.

Q. I mean, the general course of the channel.

A. Yes sir.

Q. And is that channel wider or narrower than the Cordell channel or the Woody Island channel?

A. It is wider than both, it is wider at any rate, than either.

Q. Have you ever been employed in the survey of the river?

A. Yes sir.

Q. How long did you work on the survey of the river?

A. I was on the whole survey, right through, from the time they commenced it, the government survey.

Q. What year?
A. That was in 1901, I think, the last government survey made.
Q. How long did you live near Snag Island?
A. Oh, I have been living there, I lived there, off and on, for 15 years.
Q. What is the character of Snag Island, is it sand bar, or is it covered with vegetation?
A. Snag Island is a grassy island covered with vegetation.
Q. Now, with reference to the Woody Island channel which runs south of Snag Island, will you state how near it runs to Snag Island?
691 A. Right close—You mean in '83?
Q. When you first knew the channel.
A. It ran right immediately close to it, it passed to the east of it, the channel did.
Q. Passed to the east side?
A. Yes sir, of Snag Island, to the east.
Q. And right alongside of Snag Island?
A. Yes sir; right close. That was the Cordell channel you asked me?
Q. No, I mean the Woody Island channel, the channel that runs south of Snag Island.
A. The channel runs south and passed down to the south of it.
Q. And how close to Snag Island does it run? How near Snag Island?
A. Well, it went very, right close to Brown's Port, it headed over towards Snag Island, right close to it, it run close into here, this is the point, it run in here, (indicating on map), it headed right over this way.
Q. Right near the shore of Snag Island?
A. Yes sir.
Q. When you say "the present channel" you mean what is left of Woody Island channel, do you?
A. Yes sir.
Q. It is not used now for any vessels except small vessels?
A. Yes sir, just small vessels, gasoline boats.
Q. And what would you say was the width of the Cordell channel when you first became familiar with it in '83?
A. Well, that would be probably three-quarters of a mile or a mile.
Q. Do you know what the width of Woody Island channel
692 was when you first became familiar with it?
A. Yes sir.
Q. What was the width of Woody Island channel, the one that runs south of Snag Island?
A. That would be about eighteen hundred feet, probably two thousand, from eighteen hundred to two thousand. Not over.
Q. For what period has this channel, designated on Washington's Exhibit I as the "1905 channel," been the main channel of commerce?

A. Since I have been on the river, since 1883.
Q. Was it the main channel at that time?
A. Yes sir.
Q. Has it been the main channel always since that time?
A. Yes sir.
Q. What position did you have under the Government in the survey of the river?
A. Leadsman.
Q. What did you do as leadsman?
A. Well, heaved the lead to sound the water, to see how much water there was.
Q. What part of the river?
A. Why, from Eureka to Cape Disappointment.
Q. What was the usual depth of these nets that you fished with on the river?
A. Some were forty, some were forty-five mesh deep.
Q. What was the usual size of a mesh?
A. Oh, eight and a half and then we got them a little larger, up to a nine-inch mesh.
Q. Are you familiar with the sands known as the Cook and Enyert Sands?
693 A. Yes sir.
Q. That are opposite Jim Crow Point?
A. Yes sir.
Q. Do you know when those sands first formed in the river,—They are marked on Washington's Exhibit B as the Enyert grounds?
A. Well, they showed there in '87.
Q. Do you know when they first emerged as land above the ordinary low tides of the river?
A. I think it was '89. I would not be positive whether it was '88 or '89.
Q. Were they in the same position that they are now in, or in a different position or location in the river?
A. There is very little change in them.
Q. Will you state what was the condition of the river at that locality with reference to channels before these sands formed, known as the Enyert sands?
A. Before these were formed?
Q. Yes, before the Enyert sands were formed.
A. It was wider here (indicating on map).
Q. How many channels were there at that place at that time?
A. There was practically one channel, that is, there was water all over, there was only one channel here that I knew of, (indicating).
Q. That is, do I understand you to say there was one channel from Jim Crow Point to Woody Island?
A. Yes sir.
Q. Now, when these sands formed, which shore were they nearer to, the Washington shore, designated on the map as Jim Crow Point, or Woody Island?

A. They were much closer to Woody Island.

694 Q. What was about the relative distance?

A. Well, I couldn't say. It was a long ways closer to Woody Island than they were to Jim Crow Point.

Q. Are you familiar with the location of these sands with reference to Woody Island and Jim Crow Point?

A. Yes sir.

Q. Refer to this map, which we wish to identify afterwards by surveyors,—Let it be marked for identification Oregon's Exhibit 15,—and state whether that map correctly represents the position of the Enyert and Cook ground with reference to Woody Island and Jim Crow Point, and their position in the river, according to your own knowledge.

A. According to my own knowledge, that is as near right as possible.

Mr. SMITH: We will offer it in evidence, and we will follow it up by testimony later.

Mr. MACDONALD: We will not object to it.

The map was marked Oregon's Exhibit No. 15, and signed by the Commissioners.

Q. What is the character of the channel that is south of the Enyert sands?

A. It is a narrow channel.

Q. What is its character with reference to depth?

A. It is not near as deep as on the other side.

Q. What is the character of that channel with reference to its navigability in comparison with the channel that run- north of those sands?

A. Why, it is the deepest channel for navigation on the Washington side.

695 Q. Is this channel that runs south of the sands used for navigation, or has it ever been used?

A. Not unless for small boats.

Q. What character of boats?

A. Small fish launches.

Q. Do ships ever go through there?

A. No sir.

Q. Or large steamboats?

A. No sir.

Q. Have they ever gone through there since it was formed?

A. No, not since it was formed.

Cross-examination.

By Mr. MACDONALD:

Q. Have you any personal interest in the outcome of this case, Mr. Service?

A. None whatever.

Q. Do you own any sands?

A. No sir.

Q. Have you any fishing lease?
A. No sir.
Q. Or any corporations or companies interested?
A. No sir.
Q. You say that since 1883 the Cordell channel has not been used?
A. No sir.
Q. Has the Cordell channel or the Woody Island channel ever been used since you have had any knowledge of the conditions of the river at that particular point?
A. No sir, not as I said, for any large vessels.
Q. You knew that in the year 1854, and for many years
695½ thereafter, the Woody Island channel was the channel used by sea-going vessels, didn't you?
A. No sir.
Q. You say that it is not the fact?
A. I don't know anything about it.
Q. You don't know?
A. No sir.
Q. So you would not dispute the fact that the Woody Island channel was the channel the deep sea going vessels used in 1854 and for some years thereafter?
A. I don't know anything about it.
Q. Do you know when the Cordell channel was discovered?
A. No sir.
Q. Do you know whether or not the Cordell channel, for many years after the year 1876, was the channel used by ocean going vessels coming up the river to Portland and going down again and out to sea?
A. I don't know it of my own knowledge, only from what I have heard.
Q. You have heard that was the channel?
A. I have heard it was used, yes sir.
Q. Are you familiar with the condition of Snag Island?
A. Yes sir.
Q. You are aware of the fact, are you not, that the government constructed a dike or jetty in a northeasterly direction from Snag Island across Cordell channel?
A. Yes sir.
Q. And that since the construction of that jetty or dike by the government, Cordell channel cannot be used by deep sea going vessels?
A. Well, the jetty did not do it.
696 Q. Didn't the jetty go straight across it?
A. It did, but before that vessels could not get out.
Q. How long before that?
A. Since I have been on the river.
Q. When was that jetty constructed?
A. I have forgotten the year.
Q. Wasn't it constructed in the year 1885?

A. I think it was after that, it was after '85—— Just a moment, please.

Q. When was it?

A. It must have been about '89, I am not positive, but I think it was about '89.

Q. You are familiar with the work done by the government quite close to Jim Crow Point, are you?

A. In what regard?

Q. With reference to dredging.

A. They are not dredging at Jim Crow Point.

Q. The government did considerable dredging in the vicinity of Jim Crow Point, didn't it?

A. No sir.

Q. Are you sure of that fact?

A. Yes sir.

Q. If the government engineers testify that the dredging was done there, then are they mistaken?

A. They are mistaken if they said it was Jim Crow Point.

Q. Isn't it a fact that the government did considerable dredging between Pillar Rock and the main land?

A. Yes sir.

Q. Before the performance of that dredging by the government, the channel ran south of Pillar Rock?

A. Well, I don't think—I remember when the channel
697 ran south of Pillar Rock, all right.

Q. Isn't it a fact that all the ocean going vessels used a channel or course that went south of Pillar Rock before the government did the dredging between Pillar Rock and the main land?

A. Yes sir.

Q. And that since the performance of that dredging by the government, the channel for ocean going vessels has been between Pillar Rock and the main land?

A. They dredged it there because it was deeper.

Q. The government did a lot of its dredging between Pillar Rock and the main land?

A. Yes sir.

Q. And the natural effect of that dredging would be to deepen the waters of the channel or widen the channel, or both?

A. It was a channel there anyway.

Q. The effect of the dredging would be to deepen or to widen the waters of the channel?

A. To deepen it.

Q. And perhaps widen?

A. It might be.

Q. Are you familiar with the course of the current of the Columbia river coming from the up-river down towards Jim Crow Point?

A. Towards Jim Crow Point?

Q. Yes.

A. Why, yes.

Q. What is the direction of the current at that point?

Mr. SMITH: Where are you asking him?

Mr. MACDONALD: I am asking him what is the direction of the current in the river as it approaches Jim Crow Point.

A. Well, it is westerly.

698 Q. I mean, Three Tree Point, a little east of Three Tree Point, the current comes in that direction, in a northwesterly direction, don't it?

A. Well, the turn in the river there, of course, the general current follows the——

Q. Just before the river strikes the Washington side, east of Three Tree Point, it is flowing in a northwesterly direction, isn't it?

A. Yes, it follows the Washington shore here, certainly.

Q. It is flowing a northwesterly direction?

A. Yes, that would be northwest.

Q. What is the character of the Washington shore at that point, just east of Three Tree Point, as to its being rocky and hard?

A. It is rocky.

Q. What would be the natural course of the river from that point down?

A. The natural course?

Q. Yes.

A. It would follow right straight from Three Tree to Jim Crow.

Q. Isn't it a fact that the natural tendency of the river when striking that rocky coast, would be to deflect it towards the south?

A. I am not an engineer to try to solve that problem.

Q. You wouldn't say that that is not the fact?

A. I couldn't say that it is not the fact, nor could I say that it is.

Q. Isn't it a fact that the natural course of the river would be to deflect it south, and that was the purpose of the government in constructing the jetty from Snag Island and in doing this

699 dredging in the vicinity of Pillar Rock and Jim Crow, so that the current might be held along the north shore of the Columbia river?

A. That change had nothing whatever to do with the jetty.

Q. It has not?

A. No sir.

Q. Then, if the government engineers say that the purpose of the construction of that jetty and the closing up of the Cordell channel and the performance of this dredging along the Washington shore was to maintain that channel close to the Washington shore, you say they are mistaken?

A. I say the jetty had nothing whatever to do toward the channel changing in here to the north of Pillar Rock.

Q. If the Cordell channel was the channel which was pursued by the Columbia river at that time, and an obstruction was placed across it and then dredging was done, along the north shore, wouldn't that have the effect of carrying the current along the north shore?

A. If the jetty was constructed, I suppose it would.

Q. Isn't it a fact that the jetty was constructed as it was on the Washington side, clear across?

A. The results didn't show it.

Q. You think if a jetty was constructed right across the face of
t channel, it would not have any effect upon the course of the
ter?
A. It would, but as the circumstances exist, it didn't do any good.
Q. How high or how wide is that jetty across Cordell channel?
A. It is washed open right now there, it is washed *out*
0 out.
Q. How high was that jetty as constructed originally?
A. It was below low water mark—or above low water mark.
Q. And you think it had no effect upon the course of the current
there?
A. Oh, it hasn't any more to do only it formed a lot of shoals
re.
Q. You think the Cordell channel could be used as well for
vigation after the construction of that jetty as before?
A. It made no difference.
Q. Although the jetty was constructed clear across Cordell chan-
l, it has no effect on the navigation of that channel?
A. That was closed up before they put the jetty through.
Q. You think it had no effect on the navigation of the channel
ter the jetty was constructed clear across the channel?
A. It didn't make a particle of difference.
Q. You think the steamers could ride across it?
A. No, they couldn't ride across it, but they can now, because the
ty is all washed out right across there.
Q. Did you ever make any actual measurements of these chan-
ls, the Woody Island channel and Cordell channel?
A. Only with the exception of putting a gill net across it.
Q. Just putting a gill net across it?
A. Yes. I knew the length of the net.
1 Q. You never made any engineering measurements of it?
A. No sir, not engineering measurements.
Q. You don't know exactly the width or the depth?
A. I knew the depths all right.
Q. What were the depths, and when?
A. I can't tell you the dates, I couldn't give you any dates on
e depth.
Q. You don't know what dates you made the soundings?
A. No sir.
Q. Did you make any comparison between the depths of Woody
land and the Cordell channel and this north island channel?
A. No, I had no reason to make a comparison.
Q. So that the depths which you have given are a matter of
inion rather than actual measurements?
A. No, they are actual facts.
Q. Then, what are the actual facts in that respect? You say
e north channel is deeper and wider than Cordell channel and
oody Island channel. I would be glad to have you give the depths
d widths and the times you made those measurements, if you
ade any.
A. If I had a blue print of the survey made, I could certainly
ve you every one. The blue print shows the survey.

Mr. SMITH: What year was that?

A. In 1901, I think.

Q. Did you make any surveys previous to the construction of the government jetty from Snag Island?

A. No.

Q. All your surveys and measurements, then, have been since the construction of this jetty?

702 A. Yes sir, with the exception of when I was fishing there.

Q. Did I understand you to say that the government has done no dredging between Three Tree Point and Harrington Point except merely north of Pillar Rock?

A. Oh no. That was the only dredging I know it done.

Q. Just between Pillar Rock and the main land.

A. Yes sir.

Q. Are you positive of that, Mr. Service?

A. No, I am not positive. That is the only dredging I have any knowledge of.

Q. To refresh your recollection, isn't it a fact that the government did considerable dredging east of Pillar Rock, close to the Washington shore, for the purpose of maintaining the channel, or current, of the river, close to the Washington shore?

A. East of the Rock?

Q. Yes sir.

A. The channel got deeper in there, and it got shallow out toward Oliver sands, the steamers couldn't get through any more, and they changed the channel.

Q. Isn't it a fact that if the current of a river be deflected from its accustomed current into another channel, that the first or old channel will naturally become more shallow?

A. I suppose it would.

Q. Isn't it a fact that the constant flowing of water through a given channel has a tendency to keep it in its present depth?

A. It does in some cases.

Q. The Columbia river, where Cordell channel and Woody Island channel exist, is almost its broadest point, isn't it?

703 A. Beg pardon?

Q. I say, the Columbia river is wider immediately west of Cordell channel and Woody Island channel than at any point east of there, that is, this point here (indicating on map).

A. I understand you.

Q. It is wider there than at any other point immediately west of Cordell and Woody Island channel?

A. Well, it is cut up into so many little sloughs.

Q. I am taking from the main land to the main land, that is the widest point in the river from there inland?

A. Yes, that is wider than any place I know further east.

Q. That is what is commonly known as the broad estuary of the Columbia?

A. No, they generally call the broad estuary from Gray's River to John Day river.

Q. At any rate, this point we are just speaking of, there are numerous small channels there, are there not?

A. Yes, there are some small channels.

Q. It is easier to maintain a channel, isn't it, when one side at least is up against the solid firm rock formation than where the channel exists through sand on either side?

A. Well, those are questions——

Q. I say, it is easier to maintain a channel where one side, at least, is up against a rock firm foundation, such as the north shore of the river is, than it is to maintain a channel where it flows through sands on either side?

A. It is pretty hard for a fisherman to answer a question
704 of engineering.

Q. And it is a fact, isn't it, that that has been the purpose of the government to try to have this channel maintained close to the Washington shore because on account of its rocky formation it is believed that the channel can be made more permanent and less vacillating.

A. That was not the government at all, that was the Portland Commission done that.

Q. You understand the Port of Portland Commission did all this work under the sanction and with the permission of the Federal Government?

A. I understood so.

Q. And when I ask these questions about the government, I desire to include the work done by the Port of Portland Commission, because it was done with the sanction of the government.

A. Yes sir.

Q. Then, if you understood my questions, did not include the work done by the Port of Portland Commission I desire now to inquire whether it is not a fact that the Port of Portland Commission did considerable dredging between Three Tree Point and Harrington Point?

A. They done right at Pillar Rock.

Q. Didn't the Port of Portland Commission do considerable dredging inland or up the river from Pillar Rock?

A. No sir, there was no necessity for it there, there is plenty of water.

Q. I am not asking you about the necessity, I am asking you whether or not they did it.

A. No.

Q. Are you positive of that?

705 A. I cannot swear that they did not, but not that I know of.

(Witness excused).

706 Captain A. L. PEASE called as a witness on behalf of the defendant, after being first duly sworn, testified as follows:

Direct examination.

By Mr. CRAWFORD:

Q. State your name.
A. A. L. Pease.
Q. Age?
A. 48.
Q. Residence?
A. Portland, Oregon.
Q. Occupation?
A. Master and pilot.
Q. Mr. Pease, you may state how long you have been a pilot on the Columbia river.
A. Since '76.
Q. You may state whether since said date you have been acquainted with what is called Cordell channel, immediately north of Snag Island and Kaboth sands.
A. Yes sir.
Q. You may state, Captain, whether you have also been acquainted with what is shown on Washington's Exhibit I as Woody Island channel, since said date.
A. I never knew this to be a ship channel.
Q. You have been acquainted with what is marked on this map as Woody Island channel?
A. Yes.
Q. You may state whether or not since your acquaintance with that Woody Island channel, if it has been a ship channel, or used as a ship channel.
707 A. Not to my knowledge, no sir.

Mr. MACDONALD: Since when?
A. Since '76.

Q. You may state at any time since said date what is called Cordell channel has been used as a ship channel, and if so, when?
A. Cordell channel, yes, I have used Cordell channel. (Indicating on map).
Q. You may state whether that was used as a channel or not, and if so, when.
A. Well, that was used up until the time this present channel was buoyed out.
Q. What do you mean by the present channel?
A. I mean this channel from Harrington Point.
Q. From Harrington, to where?
A. To Tongue Point.
Q. When was that buoyed out?
A. In 1882 or '83, I am not positive.
Q. Who buoyed that out?

A. Well, I put trial buoys out and the Shellbrick, under the command of Captain Strang, buoyed it out.

Q. How did that channel come to be buoyed out?

A. Well, my first knowledge of that Harrington Point channel was when Captain Barker, who was then Master of the tug Edith, told me there was a channel down through Harrington Point and a better channel than the Cordell channel and I went through with the steamer —— and I found pretty good water, and I also notified the river pilots and we sounded it out and found it was a better channel than the one we were using and then it was buoyed.

Q. Have him designate what that channel is that he is
708 talking about.

A. I have said, from Harrington Point.

Q. What line on the plat designates that channel, if any?

A. It is supposed to be the gas buoy—There is the line, (indicating on map).

Q. Is that what is marked on that plat as the 1905 channel?

A. That is as near as I can tell, yes, that is from Harrington Point past the gas buoy and No. 2 beacon, and from No. 2 beacon past No. 3 beacon, and then from Taylor's sands to the south and easterly of Taylor's sands, and into Astoria.

Q. That is what was buoyed out at that time, is it?

A. Yes sir.

Q. And you may state whether that has been used as the usual route of commerce since that.

A. Yes sir, ever since.

Q. Now, you may state, Captain, whether since 1882 or '3, commerce has followed the Cordell channel at all, or not.

A. No sir, not to my knowledge.

Q. You may state whether it has the Woody Island channel.

A. No sir, not to my knowledge.

Q. You may state whether commerce ever did follow the Woody Island channel since your acquaintance with the river.

A. No sir, not to my knowledge.

Q. You may state whether or not the general route of commerce since 1882 has been north or south of what is known as Miller sands.

A. North of Miller sands.

709 By Mr. ALLEN:

Q. As the Columbia river pilot during the period that you designate, what have been your duties?

A. Well, to take charge of steamers and sailing vessels.

Q. What sort of vessels?

A. Deep laden vessels.

Q. Ocean going vessels?

A. Ocean going vessels.

Q. Coming to and from Portland?

A. Yes sir.

Q. To various stations of commerce in the world?

A. Yes sir, and river boats.
Q. Have you been continuously engaged in that?
A. Master and pilot of ocean going vessels and also river vessels.

By Mr. A. M. SMITH:

Q. Did you ever know of any vessel being taken south of Snag Island?
A. No sir.

Cross-examination.

By Mr. MACDONALD:

Q. When does your knowledge of that portion of the river commence, Captain Pease?
A. In 1876.
Q. Do I understand you, then, at that time, Cordell channel was the one used by ocean going vessels?
A. Yes sir.

710 Q. Are you familiar with the construction and location of the jetty built by the government or by the Port of Portland Commission from Snag Island?

A. Yes sir.
Q. The effect of the construction of that jetty has naturally been to close that channel, hasn't it?
A. Which channel?
Q. The Cordell channel.
A. Well my impression of the construction of that jetty was to increase the depth and maintain a good channel down by Woody Island.
Q. Well the effect of the construction of the jetty has been to close up the Cordell Channel?
A. The Cordell channel I judge was practically closed.
Q. Well, in other words, then the construction of the jetty did not improve Cordell channel for navigation?
A. Not if they drove a jetty across it.
Q. They did drive it across?
A. That is my understanding.
Q. Are you familiar with the dredging that has been done by the Port of Portland Commission or by the Government in the vicinity of Three Tree Point?
A. Three Tree Point?
Q. Or at any point between Three Tree Point and Harrington?
A. There was never any dredging done at Three Tree Point.
Q. Has there been any dredging done between Three Tree Point and Yellow Bluff Point?
A. The Government did some dredging at Pillar Rock.
Q. The purpose of that dredging has been to maintain and improve the channel close to the Washington shore?
A. Yes, sir.

711 Q. The natural flow of that river, unaided by artificial means would be to either flow through Cordell channel or Woody Island Channel?

A. The natural flow would be along the north shore.

Q. Isn't it a fact that the river coming in that mountainous stream and striking the hard formation of the Washington shore would be to naturally deflect it away from it instead of following close to it?

A. It has not shown that way.

Q. Then if the Government reports and the Government Engineers say that the natural tendency of the river is to be deflected from the shore in the vicinity of Three Tree Point in a southwesterly direction then they are mistaken?

A. Of course the idea is this, there are sands formed all along down the river and close up——

Q. Answer the question.

A. I think the direction was always down the north bank, always has been.

Q. You think the deepest and best channel has always been along the north bank?

A. Yes, sir.

Q. Have you ever made any surveys or measurements there?

A. Not other than soundings.

Q. If the Government surveys and measurements show that Woody Island channel and then the Cordell channel for some years afterwards were the deeper and better than the north channel would you say they were incorrect?

A. No, I don't think I would.

Q. Yours is only an opinion and is not based on actual surveys and measurements?

A. No, sir, mine is based on actual knowledge.

Q. What do you derive your actual knowledge from?

A. From operating on the river.

712 Q. Have you measured it or surveyed it?

A. No, but piloted deep draught vessels.

Witness excused.

(Here an adjournment was taken until 10:00 o'clock A. M., tomorrow, September 14, 1906.)

"THE PORTLAND",
PORTLAND, OREGON, *September* 14, 1906—10 o'clock a. m.

Taking of testimony resumed pursuant to adjournment, all parties present.

Mr. MACDONALD: Let the record show that Hon. John D. Atkinson, Attorney General of the State of Washington, is present and appears with counsel for the State of Washington.

713 H. EMKEN called as a witness on behalf of the defendant, after being first duly sworn, testified as follows:

Direct examination.

By Mr. CRAWFORD:

Q. Captain, state your name, age, residence and occupation.

A. My name is H. Emken, my residence, Portland, Oregon; my business is master and pilot.

Q. Your age, you did not state.

A. My age is 62.

Q. You may state how long you have been a river pilot, Captain.

A. A river pilot, I have been a river pilot since '68.

Q. You may state where you have run on the river since '68.

A. I have run principally on the lower river, except I run a little on the upper Willamette in the '70's.

Q. What do you mean by the lower river?

A. I mean between Cape Hancock and Portland, Oregon.

Q. You may state whether during that time, from '68, you have been acquainted with what is called Woody Island channel and Cordell channel.

A. Yes, we used to use that altogether them days.

Q. When did you use to use that?

A. The first was in the fall of '67, towing some schooners and principally in '68, we started in. Some small vessels and some larger vessels. We got stuck there one time, I think it was in the spring of '68, we got stuck down there. We had a vessel, I think it was a french vessel, called the Louie, I think she was drawing about 19 feet of water. I took the boat and sounded on the south side of Snag Island, and found but 10 or 11 feet of water at low water, that is, at low tide. I found 15 on the other side, on the north
714 side of what they call Snag Island and of course we waited for the tide to get off, and we went out that way and afterwards we used that altogether. I don't know whether they used the south side of Snag Island, I never went around there excepting with a light draft boat.

Q. How long was the Cordell channel that side of Snag Island used for commerce?

A. To my knowledge, it was used until somewheres about '82 or '83 and we found the channel across at what we called Yellow Bluffs or Harrington Point.

Q. Where does that channel go from near Tongue Point?

A. Near Tongue Point and past Astoria you run right straight out towards about Pillar Rock, that is, the old Cordell channel, and then it turned up to the south and went around to the north of Snag Island and to Brownport Slough, and right straight across to Jim Crow Point.

Q. After '82, that was used up to, say, until about '82?

A. '82 or '83, somewheres around there.

Q. Then where did you run?

A. Past Harrington Point and towards Pillar Rock.
Q. Where has the ocean commerce been going since '82?
A. Always around there ever since.
Q. Now, you may state whether or not that is north or south of Miller Sand?
A. North of Miller Sands, ever since '82 or '83, somewheres there, I don't exactly remember whether it was '82 or '83, but ever since that time.
Q. State whether, since the Cordell channel was abandoned, they have gone north of Miller Sands.
A. They have ever since that time. I went around there with a boat with the Port of Portland Commission with me, and
715 we got aground there. We was trying to find water through there, and we couldn't get through.
Q. Through where?
A. Through the Cordell channel. It was all filled up.

Cross-examination.

By Mr. MACDONALD:

Q. Woody Island channel was the main channel of commerce down until the discovery of Cordell channel in about the year 1876?
A. Well, now, the Woody Island channel and the Cordell channel, I could never see any difference, but ever since I done any work, that is, in towing in the early days, we always used the north side, which I believe they call the Cordell channel. I never went on the south side of Snag Island with any vessels.
Q. When did you first go on the river, in '68?
A. I first went down there in the fall of '65.
Q. Did you then go through Woody Island channel or Cordell channel?
A. I went through that same channel there, yes.
Q. When did you say that Cordell channel ceased to be used as the channel of commerce?
A. It was used up to '82 or '83.
Q. What is the effect on a channel of vessels going through it continuously, doesn't it result in keeping the channel open?
A. Not necessarily so.
Q. It would have a tendency to?
A. Not necessarily to, because we found lots of places where we go it would still fill up.
Q. I will put that the other way: If a channel has been
716 used for a number of years by large steamers and then such use ceases, the tendency then would be for the channel to fill up.
A. It would fill up anyway, it has a tendency to fill up.
Q. The tendency would be greater if it was not used at all?
A. Not necessarily so, it all depends on where the current is going.

Q. Are you familiar with the dredging which has been done by the government in the vicinity of Pillar Rock?

A. Yes sir, I am.

Q. Before that dredging was done between Pillar Rock and the main land, the channel there was south of Pillar Rock, wasn't it?

A. It was for a little while south of Pillar Rock.

Q. And after the dredging?

A. No, we started to use that channel before they started to do the dredging.

Q. What is the effect of the dredging between Pillar Rock and the main land, to improve the channel?

A. The reason they did the dredging there was really not this, we could go through there any time in high water, but to get the thing running a little faster, we asked the government to put the dredger through to take it out so we didn't have to wait for high tide, so we could go down at low water.

Q. The effect of that dredging between Pillar Rock and the main land, was to increase the depth and perhaps the width of the channel there, and likewise improve it for navigation?

717 A. Certainly it would. Any place you dredge it improves it for navigation.

Q. Are you familiar with the dredging which has been done between Harrington Point and Yellow Bluff and Tongue Point?

A. I am, yes.

Q. A considerable amount of dredging has been done between those points by the government or by the Port of Portland Commission?

A. The government has done it altogether.

Q. A considerable amount of work has been done there?

A. Yes, the dredger has been at work there, I should judge, between Harrington Point, say, between Jim Crow and Astoria, they keep a dredger at work there the year round, principally. That has been for the last few years.

Q. For the last twelve or fifteen years?

A. Not twelve or fifteen years, only for the last two or three years.

Q. Previous to that, for the last twelve or fifteen years, hasn't a considerable amount of dredging been done between Jim Crow Point and Tongue Point, along the Washington shore?

A. Not any at all, not for fifteen years.

Q. I think you are mistaken, because you just testified a moment ago, that there was considerable done there.

A. You say fifteen years ago?

Q. I say within the last fifteen years.

A. I would not talk, because that is no way to ask anybody, I said the last two or three years.

Q. I asked you if it is not a fact that during the last twelve or fifteen years——

A. Say in the last six years.

Q. Let me ask my question, and then you can answer it.
718 I ask you the question now if it is not a fact that during the last twelve or fifteen years, a considerable amount of dredging has been done by the government between Jim Crow Point and Tongue Point along a course near the Washington shore?

A. I would not say twelve or fifteen years, because it is not necessary there. Within ten years there wasn't any dredging whatever. In the last eight years there wasn't. In the last few years, but not fifteen years ago.

Q. None done twelve years ago?

A. No sir.

Q. And none done fifteen years ago?

A. No sir, not around there.

Q. None done ten years ago?

A. None around there ten years ago.

Q. Eight years ago?

A. Eight years ago, '98, there might be in '98, some in that neighborhood.

Q. You say there was no dredging done at any place between those two distinct points, Jim Crow Point and Tongue Point, before '98.

A. I couldn't tell, I don't know, to keep exact track of it. I might not be positive of it, not to be sure.

Q. You are not very sure of the dates?

A. I am very sure there was none done fifteen years or twelve years ago.

Q. You are certain there was none done twelve years ago?

A. Yes.

Q. If the government reports show that there was dredging done twelve years ago, they are mistaken?

A. None at this point.

719 Q. I confine myself in the question to Jim Crow Point and Harrington Point and Tongue Point.

A. What do you mean?

Q. You testified a moment ago, there was some dredging done between Harrington Point and Tongue Point.

A. There was dredging done every year.

Q. When did that dredging commence?

A. I didn't keep tally of that; that is not in my business.

Q. Are you a pilot at the present time?

A. I am.

Q. A river or a bar pilot?

A. Not a bar pilot.

Q. Just a river pilot?

A. Yes sir.

Q. Your jurisdiction is just up the river from Astoria?

A. Yes sir.

Q. You don't go down the river?

A. Sometimes I go down towards Stevens.

Q. Do you know where the Hog's Back is?

A. The Hog's Back above Astoria?

Q. Yes.

A. There used to be one somewheres, I think, about between B. & C, somewheres around there, what we call the Hog's Back.

Q. I would like to direct your attention to Washington's Exhibit I. This section of sand between Harrington Point or Yellow Bluffs, and Tongue Point, immediately in the vicinity of the word "line" in red ink, on top of the red line marked "1859 channel," and which, I understand, is commonly known as the Hog's Back, (indicating on map.)

720 A. That is right, the Hog's Back is up in here, somewheres up in here, (indicating). When I came up in here, we had beacons in here commencing with the lettering from A, B, C, D, I, and H. Now this is the north of Snag Island and this is south (indicating on map).

Q. When you came in there, you followed the course which is delineated on this map by the red line marked "1859 channel," running first through Woody Island channel and subsequently up through Cordell channel and north of Snag Island?

A. Well, I never came around there that way with any vessel that had any draught at all.

Q. You came through Woody Island channel?

A. This one, (indicating).

Q. That is Woody Island channel.

A. South of Snag Island. We always came around it; in '68 was about the first we commenced towing vessels to amount to anything, you know. We went around this way, (indicating).

Q. Don't say "this way," that don't mean anything in the record. Say either north or south of Snag Island.

A. Well, north of Snag Island.

Q. Through the Cordell channel?

A. Yes.

Q. A considerable amount of dredging has been done on this Hog's Back, through the Hog's Back?

A. This you say is the '59 channel. I don't know anything about that. Here is the Hog's Back, I think if I am not mistaken, right here. I think this is the Hog's Back, (indicating). There was no dredger there, but I'll tell you what they did, they went and took a steamboat and took a harrow and dragged it back and forth.

721 Q. That would have a tendency to dredge it?

A. That would have a tendency to wash away the sand.

Q. Tell us where the dredging was done on this map between the Yellow Bluffs and Tongue Point.

A. The dredging at the present time, let me say, they are dredging over here down here, down the No. 3, then they—where is No. 2?—Here, here is No. 2. They did a little dredging from No. 2 and around here anyways. Then they done a little dredging down to Taylor's sand. They are doing a little dredging right here, and then another way right across the low sands. This is the sands, right across here, and they kept "The Lad" going there on this place here, and this place here, (indicating), and a little place right in here by No. 2, and then right in here and there, (indicating).

Q. That does not indicate anything in the record. All those points you have described as having dredging done upon them, are along the channel of the river, which is shown on this map, Washington's Exhibit I, by the black line delineating the 1905 channel?

A. Yes.

Q. Up to the point where it joins this blue line marked "boundary line as claimed by "Oregon"?

A. Yes.

Q. That is the fact, isn't it?

A. That is the channel they are using now, right through. The dredging has been done along there, just as I said.

Q. This black line marked "1905 channel line," correctly shows the channel used by deep sea going vessels and steamers in coming up and going down the river in the year 1905, and at the present time, doesn't it?

722 A. Yes. Well, I can't tell just about the way it goes, I couldn't tell exactly or not.

Q. I want you to tell us exactly. This is Washington's Exhibit I. You may examine it. You will find that it was issued by the United States Coast Survey, and is the latest map on the subject. Assuming that these beacons are on there correctly, and buoys, I wish you would examine that black line marked "1905 channel line," and see whether it is correct or not as to whether or not it shows the course pursued by the largest steamers. In other words, as to whether or not it is now the main ship channel.

A. (Witness examines map.) Well, they haven't got the things marked at the present time that is marked on the chart. Yes, that line is about correct, yes, that is about correct.

Q. Do you know when the dredger Ladd was built?

A. The Ladd. Now you are asking me something, it takes quite a little study to do that.

Q. To refresh your memory, I will ask you if it was not built in the year 1890 or 1891, fifteen or sixteen years ago.

A. Wasn't she built before 1890, I thought she was built about 1889, or somewheres around that neighborhood. I think it was something about that time. I know she was built before we had the freshet in the Willamette, and that was in 1890. She was built when Major Handbury was here, and I think that was the time he was here from '88 to '92, I think. John Steffens down here, built her.

Q. She has been in use most of the time since that, hasn't she?

723 A. I couldn't say *if* that. She has been laid up considerable, but she has been in use more or less all the time. She has been used very little up the river, been used principally in the bay all the time.

Q. By the bay, you mean what part of the river?

A. Cathlamet Bay, what they call Cathlamet Bay.

Q. In that section of the river between Tongue Point and Jim Crow Point?

A. Yes.

Q. Are you familiar with the construction of the government jetty on Snag Island?

A. I am, somewhat.

Q. When was that jetty constructed?

A. When?

Q. Yes, about when, Captain?

A. Now, I can't just remember now. It seems to me like it was somewheres about the latter part of the '80's, somewhere about there.

Q. The effect of the construction of that jetty across Cordell channel was to block it up so it could not be used at all for deep sea going vessels?

A. No, the way I understood it, Major Handbury was, or the idea was, to provide the channel on the south of Snag Island.

Q. That is not an answer to my question. I say, the effect of building that jetty right across the face of Cordell channel, was to stop up the channel, so it could not be used by steamers?

A. To stop up the channel where?

Q. The jetty from Snag Island goes in the northeasterly direction clear across Cordell channel, doesn't it?

A. Yes.

724 Q. And of course, after the construction of that jetty across the channel, vessels could not go through the Cordell channel?

A. No, they didn't go down through there,—Yes, they did; they went down here.

Q. They couldn't go through that channel, then.

A. No, of course not. They couldn't go through there before that. That was the reason that they constructed that jetty, to shut that out around here, right straight down to the Tongue.

Q. Don't you know what the course of the current in the Columbia river is when it comes to the main land, to Skamokawa Creek?

A. Well, it follows the bluff right down.

Q. It is then flowing in a northwesterly direction?

A. It goes in a little northerly direction before it turns around and goes in a little southerly direction.

Q. The natural direction, then, of the river, after striking the shore, would be to the south from what?

A. After it leaves Three Tree Point.

Q. It naturally goes southward?

A. Yes, it goes a little south and westerly.

Q. And the purpose of this dredging on the Washington shore and Pillar Rock was an effort of the government to maintain the channel up towards the Washington shore?

A. Not necessarily, the channel was there before they started to dredging, but was not so deep.

Q. Didn't the dredging improve the channel?

A. Yes sir, certainly.

Q. Wasn't it then the purpose of the government to maintain and improve that channel along the Washington shore?

725 A. Certainly. They dredge anywhere to improve a channel. After you get a channel once, you want to improve it.

Q. Woody Island channel had not been in use for several years, had it, before the construction of the Snag Island jetty?
A. It had not been used, no.

Redirect examination.

By Mr. CRAWFORD:

Q. You may state, Captain, whether you have ever known of any ship of any considerable size passing south of Snag Island?
A. I never knew one. Now, gentlemen, I want you to understand that in them early days, we had no ships of any size coming here to amount to anything. They mostly was all coasters. I think in '68 the first foreign ship we had there was the French ship Louie that came in '68 and we towed her up. They didn't have no tug boats them days. We had nothing but coasters, principally. "Live Jack" and those vessels, that was only drawing light, about six or seven feet, and when loaded, they drew about fourteen.

(Witness excused.)

726 Captain J. W. BABBIDGE called as a witness on behalf of the defendant, after first being duly sworn, testified as follows:

Direct examination.

By Mr. CRAWFORD:

Q. State your name, age, residence and occupation.
A. J. W. Babbidge, 63 years old; I am steamboating on the river, a pilot.
Q. You state that your occupation is a river pilot?
A. Well, a steamboat man. I have piloted vessels too, but not lately.
Q. How long have you been a steamboat man on the river?
A. Since '67.
Q. You may state, Captain, whether since that date, you have been acquainted with what is called Cordell channel.
A. Yes sir.
Q. And with what is called Woody Island channel?
A. Yes sir, what used to be called Woody Island channel, and then they had what they called Snag Island channel?
Q. Where was Snag Island channel?
A. Down there by Snag Island.
Q. Which side of Snag Island?
A. That was on the south side of Snag Island.
Q. That was part, then, of what is designated on the map as Woody Island channel?
A. Maybe it is.
Q. Just look at this map and see. There is Snag Island, and this shows Woody Island channel.
A. Yes. We used to call this Woody Island channel; a long time

ago they called this Woody Island channel up towards Woody
727 Island and this Snag Island channel, (indicating on map).

Q. The part by Snag Island, they called Snag Island channel?

A. Yes sir.

Q. And the part by Woody Island they call Woody Island channel?

A. Yes sir.

Q. Now, Captain, since your acquaintance with the river, state whether commerce has gone through what is called Cordell channel generally, or whether it has generally gone through that portion of Woody Island channel south of Snag Island.

A. Gone through the Cordell channel ever since 1868.

Q. Were you acquainted with the commerce on the river prior to '68?

A. Yes, for a few years.

Q. Was there much of any commerce there?

A. No, there wasn't any, much, only a few coasters between here and San Francisco.

Q. Now, then, from '68 to the present time, where has the bulk of the commerce gone?

A. Well, it went——

Q. North or south of Snag Island?

A. It has gone north of Snag Island.

Q. Up to what date did it run through Cordell channel north of Snag Island?

A. Up to '82.

Q. And then from that date, where has the general commerce been?

A. Gone across to Yellow Bluffs.

728 Q. From Tongue Point across?

A. From Tongue Point across?

Q. You may state whether or not since that date, it has gone north or south of what is known as Miller's sands.

A. Gone north.

Q. State whether, from '68 to '82, when commerce was being carried on through the Cordell channel, whether it was north of what is called now Kaboth sands, or south.

A. Yes sir, that was marked on the chart.

Q. Was it north or south?

A. North.

Q. And also what was called Enyert sands?

A. Enyert sands was pretty close in the channel there, but a little to the east of that, southeast of that, right close to the banks, or right close to the channel.

Q. You may state, whether, from your acquaintance with it there, you have also noticed the width of those various channels.

A. Well, I don't know. Of course, we had a course that we used to follow up and down the river. Some places it would be narrow.

Q. Now, take the channel where commerce is now, carried on,

north of Miller's sands, and the Cordell channel, which is relatively the wider channel?

A. Well, the one north of Miller sands.

Q. Well, how long has that been the widest channel?

A. It has been since '82.

Q. And was it the wider channel when they commenced using it?

A. Well, it was a wider channel than Cordell channel when they commenced using it, because Cordell channel filled up at
729 the head of Snag Island and was abandoned.

Q. You may state when they were using Cordell channel from '68 to '82, what was the comparative width of that channel, taking its whole length, as compared with the Snag Island or the Woody Island channel.

A. It was a better channel, a good deal, than the Snag Island or Woody Island channel on the south side of Snag Island. They had Middle grounds on the channel, but of course the sands didn't come out in low water. They used to come down to what they called "Marsh Island" and as you went down, they kept a little more to the south to the lower end of the island at that time. That was a long time ago.

Q. When was that?

A. That was when they run on the south side of Snag Island.

Q. That was before.

A. That was '65, '64, or '65, before they found Cordell channel; I guess the Cordell channel was there, all right. I run a schooner for the gas company, and there was no boats to tow, and when we got close to the Cordell channel, we didn't know it was there, and we had to stay there, and the next day there was no wind, and she drifted into the Cordell channel, and we didn't know she would go through, and we had to let out the anchor to keep her out of it. If we knew it was there, we would have let her go.

Q. Afterwards it was found?

A. Yes sir. The survey schooner "Master" was there, and they surveyed there, and Captain Cordell was master of her. That is the reason we called it Cordell channel. He was master of her
730 in '68.

Q. Since they surveyed that, they have followed it up?

A. Yes sir, they followed it, until '82.

Cross-examination.

By Mr. MACDONALD:

Q. You never made any measurements yourself of these channels?

A. No sir, I did not.

Q. So when you said one was wider or deeper than another, that is just an estimate upon your part?

A. This schooner that was in this Cordell channel about that time, we used to be able to beat her in tack and we couldn't on the south side.

Q. But you never made an actua' measurement?
A. No.
Q. Do you know when the Snag Island jetty was built?
A. I think it must be somewheres in '92 or '3.
Q. The effect of that was to close up that Cordell channel, wasn't it?
A. I don't know what it was for. The Cordell channel was closed up before that was built.
Q. Was it entirely closed up?
A. You couldn't make the turn around the head of Snag Island to get into it.
Q. And it has never been opened up since?
A. Not to my knowledge. The object, I understood, of the Port of Portland, was to force the current to the south side of Snag Island when they built that, to wash out the south channel.

731 Q. Are you familar with the dredging that has been done on the Washington shore in the vicinity of Pillar Rock?
A. I am not very familiar with it, I have not been up the river in the last years.
Q. Are you a pilot at the present time?
A. I hold a pilot's license, but I am not using it.
Q. When did you cease active work as a pilot?
A. Piloting vessels, in '89.
Q. You have done no piloting since '89?
A. I have run steamers, I hold a steamer's license.
Q. When did you last run on the river there as a steamer or as a pilot?
A. I haven't piloted any deep water vessels since 1889. I have done steamboating there ever since.
Q. When did you do your last steamboating?
A. I am liable to do it any time now. Of course, I am not working particularly all the time. Here, two months ago, I was running a boat.
Q. Where were you running a boat?
A. I run up here to Portland and back.
Q. What I want to know is, when did you cease to do continuous and active work on the river there as a captain or a pilot of a steamer.
A. I have not ceased at all, yet.
Q. When did you do any continuous work for a month at a time, say?
A. It has been some time since I done it up this way.
Q. Well, how long?
A. The last time I had a boat up here was in May.
Q. How long were you working then?
A. Just a few months. I'd go up and down the river considerable there on boats.

732 Q. You are familiar, are you, with the conditions of the river between Tongue Point and Jim Crow Point?
A. I think I can run a boat there, all right.
Q. Have you been on the river enough to know the various changes which have taken place there in the last few years?

A. Yes, I know there are changes there all the time. But the channel is all marked out there plain enough. Anybody who knew anything about steamboating ought to be able to follow it.

Q. Your knowledge of the river between the points I have named, then, is based upon the charts, rather than upon personal knowledge, isn't it?

A. What I go by now, is by the guides to navigation.

Q. Issued by the Federal Government?

A. Yes, the buoys and beacons are put down by the Lighthouse Department.

Q. It is all done by the United States Government?

A. Yes sir.

Q. Are you familiar with the dredging which has been done between Yellow Bluffs and Tongue Point?

A. I don't know very much about it. I know the dredger worked a long time between Astoria and Tongue Point.

Q. I am asking you between Tongue Point and points up the river.

A. I don't know much about that. Of course, I have seen it in there, but I paid no attention to it.

Q. When did you first see any dredger between Tongue Point and Yellow Bluffs?

A. Well, I don't remember when it was. I never paid any particular attention to it. They didn't do any dredging there while I was piloting deep water vessels.

733 Q. When was that?

A. I quit that in '87.

Q. Any dredging that you think has been done has been since then?

A. Yes sir. There was, in '73 they had a dredger down there to dredge out the old Hog Back. That was not either a dredger, they made a harrow, and dragged it out. I think it was in '73 or '74.

Q. You spoke a few moments ago about the Kaboth sands and said they were south of some sands. I wish you would tell me that again, please. Attorney General Crawford asked you a question about whether the Kaboth sands were north or south of Cordell channel.

A. South of Cordell channel. This is the Cordell channel over here, and the Kaboth sands is somewheres in here; (indicating on map).

Q. Referring to Washington's Exhibit I, which is the map before you, show me where Kaboth sands are.

A. Well, the Kaboth sands must be in about here somewhere, (indicating).

Q. Point out exactly where they are. You said they are south of that channel, and I want you to point me exactly where Kaboth sands are.

A. I don't know as I could point you exactly, but I know they are south of Snag Island.

Q. How do you know that?

A. That is where they have been up there.

Q. Have you ever been on the Kaboth sands?
A. I have been past it, but I have never been on it.
Q. How long have you been familiar with the Kaboth sands?
A. I have not been familiar with it very long. I have
734 been up there.
Q. How long have you been familiar with it, five or six years?
A. No, I think about four years ago.
Q. Do you know whether or not Kaboth sands ever shifted their position in the river?
A. I don't know.
Q. Do you know when they were formed there?
A. No, I don't know.
Q. Do you know what the character of the formation is?
A. Sands, I suppose, like silt. Like all the rest of the sands in the river.
Q. You think it is a silt island?
A. Sand and silt.
Q. Which is likely to shift and move from year to year more or less?
A. I suppose it is.
Q. Have you ever been on Sand Island at the mouth of the river?
A. Yes, sir.
Q. How long have you known about Sand Island?
A. Since '64.
Q. That island has shifted very considerably, hasn't it, in that time?
A. Yes sir.
Q. Now, are the Kaboth sands of a similar character to Sand Island with reference to their composition?
A. I don't know, they may be; I don't know.
Q. You have been on Sand Island?
A. Yes sir.
735 Q. You know the character of the formation, then?
A. Yes.
Q. Isn't it silt, just the same as Kaboth sands?
A. I suppose it is, in a measure, about the same thing.
Q. And it is likely to move, too?
A. It is likely to move, sands will move and change all over the river everywhere.
Q. All through this section of the river, from Three Tree Point on to Tongue Point, the islands are liable to shift a little, are they not?
A. Yes sir.
Q. And the channels are continually shifting a little?
A. The channels are shifting.
Q. Where do you say Enyert sands are?
A. Enyert sands is in here somewheres, in here pretty near that line, I should judge. (Indicating on the map.)
Q. That is near what?
A. Near Woody Island.

Q. South of that red line there which is marked "1859 channel line," in red ink?

A. Yes sir, very near there. Before they had all the lights and beacons in the river when you used to come down at night time, you would come and see that open creek, and that cape, and then you would run down here (indicating).

Q. Down near the Woody Island channel?

A. Yes sir.

Q. You are positive that Enyert sands are south of this red line?

A. It would be southwest from Woody Island, where I have seen it as I passed up and down the river. I have never been

736 on it.

Q. What did you say about Miller sands, I wish you would point them out for us.

A. This is Miller sands in here (indicating).

Q. That is immediately south of the letters "1905" in black, about the middle of the map, and just west of the junction of the black and blue lines?

A. It would be east, wouldn't it? That is east.

Q. I mean east.

A. Yes, east.

Q. What is your answer to that question?

A. Just east of the junction.

Q. (Former question read to the witness).

A. Yes.

Q. And about 1 mile north of Cordell channel?

A. Well, I don't know what the distance is, I couldn't tell that.

Q. And about one mile north of Cordell channel, it may be a mile and a quarter north?

A. Yes.

Q. Have you ever been upon Miller sands?

A. No sir.

Q. Do you know what the formation is?

A. I don't know.

Q. It is probably silt, isn't it, like the others?

A. Like all the rest of the sand in the river.

Q. Do you know whether it has increased or decreased in size in the last 20 years?

A. No, I don't know; I wouldn't say.

Q. Nor whether it has moved or not?

A. No sir.

737 Redirect examination.

By Mr. CRAWFORD:

Q. As far as that distance is concerned, from Cordell channel to Miller sands, is merely a guess?

A. Yes, I suppose so.

Q. As far as your testimony is concerned?

A. The only way I could tell would be to take dividers and measure the chart.

Recross-examination.

By Mr. MACDONALD:

Q. Well, will you do that, Captain?
A. Have you got one?

Mr. CRAWFORD: Note in the minutes there that the counsel for Washington requests the witness to take a piece of paper and measure on the map and then give his estimate.

A. If you go from the edge of the Cordell channel to the edge of the sands, it makes a mile and a quarter to the edge of the other channel.

Mr. CRAWFORD: That is according to the information just furnished you by Mr. Hegardt, the engineer for the State of Washington, is it?

A. Yes sir, well, the chart there shows the miles on it there.

Q. You have used the ordinary scale on the map for the purpose of determining that?

A. Yes sir.

Q. And according to the scale printed on the map the
738 distance is a mile and a quarter?

A. Yes sir, from one channel to the other.

By Mr. CRAWFORD:

Q. Then your testimony is based entirely on what you observed on Washington's Exhibit I, is it?

A. Yes sir.

Q. ——

(Witness excused).

739 Captain S. D. ADAIR, called as a witness on behalf of the defendant, after being duly sworn, testified as follows:

Direct examination.

By Mr. CRAWFORD:

Q. State your name, age, residence and occupation.

A. S. D. Adair; Astoria, Oregon; age, 59. I am in the real estate and insurance business, and the timber business.

Q. Have you ever been a pilot?

A. No sir.

Q. Or a steamboat man?

A. Nothing except a pilot on the lower river; I had a license as a pilot on the lower river for small steamers once.

Q. State how long you have resided in Astoria.

A. My father came there in '49, and I have lived there almost continuously ever since.

Q. You may state, Mr. Adair, whether you have any recollection of whether there was a middle channel in that lower river there from about '56 to '60, and if so, where it was.

A. Yes sir, there has always been a middle channel there, as far as my recollection goes.

Q. Where was it?

A. The channel has changed from the mouth, the entrance to it has changed very much on account of the movement of the sand. In the early days, the north channel was used almost exclusively and we came around almost under Cape Disappointment,
740 north of Sand Island, and on the north end of Sand Island, and then there was a middle channel starting at the head of Sand Island and running almost the middle of the river, is my recollection. And then there was a trench where you could cross north of Desdemona sands, over almost to Smith's Point, perhaps a little above.

Q. Was the middle channel north or south of Desdemona sands?

A. That middle channel to Astoria was north of Desdemona sands in the early times. There was no Desdemona sands there in '56 or '57, to amount to anything. The first recollection I have of Desdemona sands at all was the wrecking of the vessel on the sands where there was shallow water.

Q. When was that?

A. Well, I should think the wreck of that vessel was back sometime about '57 or '8.

Q. Then, do I understand you to mean that the Desdemona sands were formed around that wreck?

A. Well, perhaps it might be to a certain extent, I don't know. The vessel, she was never gotten off. There was always a channel down the same channel there is now, that is, where the south channel and the Astoria channel came down on the south side just as it does at the present time; and then you could go into that middle channel. I was going to say that about that time, the same date, during that period from '56 to '66, or '70, vessels could go directly from about where the O. R. & N. Company's wharf is now, directly across to what was called or we spoke of then, as the Yellow Bank. There was a vessel wrecked in early times right at the Yellow Banks.

741 Q. Where are the Yellow Banks?

A. They are across on the Washington shore.

Q. Near the Yellow Bluffs?

A. Near Harrington Point. There was a slide or something, there, that made the appearance of yellow on the land. That name, I suppose, has been forgotten by most people.

Q. You may state whether you are acquainted with where vessels run after they reach Tongue Point, or opposite Tongue Point, from '50 to '66, from '56 to '66.

A. From '56 to '66?

Q. Yes.

A. I think that up about sometime in '62 or '3, there was a channel, there was a channel discovered that was used by Mr. Hiram Brown, who was pilot on a steamer which run around the Sylvia De Grasse and curved in close to the shore, and then around Tongue

Point and out north of Tongue Point a little ways and almost straight up the river to the north of Sand Island. The channel was over there for quite a number of years.

Q. How long was that used?

A. Well, I think it was used up into fully, I think it was '77 or '78, around there, continuously.

Cross-examination.

By Mr. MACDONALD:

Q. What year did you have a license as a pilot, or years, I should say?

A. I had a license as a pilot just for running a small boat, you know. I was in the cannery business at that time, from '74 to '81, I was in the cannery business, and from '77 to about '80, I
742 had a license.

Q. You did not operate there, you did not make piloting a business?

A. Oh, no, no!

Q. It was just for your own accommodation?

A. For my accommodation, I had a tender that carried fish to the cannery.

Q. You never made a study of that river, for the purpose of engaging in piloting, did you?

A. None at all.

Q. You never did any piloting except upon your own hook?

A. No, only for myself.

Q. Did I understand you to say, when you first came to Astoria, the channel of the river out to sea, was north of Sand Island?

A. Yes sir.

Q. What year was that?

A. I didn't say, the first year, because I don't recollect back to '49.

Q. Fix the first date.

A. My recollection would fix it from '56 or '57.

Q. In '56 or '57, do you say the channel of the river out to sea was north of Sand Island?

A. Yes sir.

Q. North of Sand Island, as it then existed?

A. Not where Sand Island is now, by no means; because Sand Island has shifted very much.

Q. Isn't it a fact that the channel which you speak of passed at a point which is south of where Sand Island now is?

743 A. I couldn't say that, because I am not familiar enough to know where Sand Island is now, but I can say this, and I can swear to that, because I have a positive recollection that in 1862 I came up in January, on January the 8th, 1862, on the steamer from San Francisco.

Q. And you passed north?

A. And came in right under the Cape and passed north to the head of Sand Island as it was at that time.

Q. Sand Island after that time, moved three or four miles to the north?

A. Over to the north.

Q. Isn't it a fact that at the same time there was another channel going out to sea which was south even of Sand Island as it existed in 1856?

A. Yes, sir. I don't say in 1856, but it did exist. I don't know that date. That was not frequently used until later on.

Q. Isn't it a fact that that south channel was a better channel?

A. It was afterwards used a great deal. They differed. At that time the north was better than the south, and then again the south would be better than the north.

Q. They fluctuated from year to year?

A. Yes. In 1874 the north channel was not used at all.

Q. In 1874?

A. No, sir. The south channel was then used.

Q. That north channel that you speak of, did that go north or south of Desdemona sands?

A. The channel in the early times, the first channel over there, was a channel,—I don't say it was the main channel either,
744 at all, it was the middle channel of the river. You could cross over from the middle channel north of Desdemona sands.

Q. Now, when you first had any knowledge of the river and channels out there, isn't it a fact that the main ship channel from Astoria to the sea, or from Portland to the sea, passed south of Desdemona Sands?

A. Oh, ever since, yes, ever since 1860, ever since 1860.

Q. You have never made any particular study of the locations of those sands, have you?

A. No, sir.

Q. Your testimony is based somewhat upon casual observation?

A. From my observation and from my experience on the lower river off and on. I have been on steamers going back and forth.

Q. But you had no occasion to make a careful investigation or examination into the width?

A. No, sir, I don't pretend to be any expert at all, more than simple recollection.

(Witness excused.)

745 Captain JOHN W. WELCH called as a witness on behalf of the defendant, after being first duly sworn, testified as follows:

Direct examination.

By Mr. CRAWFORD:

Q. State your name, age, residence and occupation.

Q. John W. Welch; my age is 60 years last February. Occupation has been steamboating part of the time. I carry a license now

for steamboating. Before that, I was running a scow. Residence, Astoria.

Q. How long have you been a pilot on the river, Captain?

A. Well, about '76, I think, was when I got my license. Then I had a special license before that, in '67, I had a special license, but I didn't do a great deal of steamboating. There was a small steamer called the Eagle, at that time, running here.

Q. Are you a bar pilot?

A. No, sir.

Q. Not a bar pilot?

A. No, sir.

Q. State, Captain, whether you are familiar with the channels inside the bar.

A. Well, I have been.

Q. The channels of the Columbia river from the bar to Portland.

A. I have been; yes, sir.

Q. You may state whether or not, in your early acquaintance with the river, there was what was called a middle channel, and if so, state where it was, and is.

746 A. Well, what is called the middle channel virtually was seemingly at the lower end below Astoria, was nothing but a wide expanse of water without any sandbars in it, seemingly, except one small bar that was close in to what we call Raymond's Point or Tansy Point.

Q. Where was that?

A. Running from the Washington shore across to this place, (indicating). Right, you might say, excepting one island at the mouth of the river. After you came in past Sand Island, you could sail almost directly from the Cape into Astoria.

Q. Was that wide expanse of water north or south of Desdemona sands?

A. It was north of it, sir.

Q. You may state whether you have been acquainted and are acquainted with the channels called Woody Island channel and Cordell channel.

A. I am, sir.

Q. You may state whether either of those channels have been used as the channels of commerce.

A. They have, both of them, sir.

Q. At what time, Captain?

A. Oh, about the '60's; along in the '60's they used the inside channel, called the Woody Island channel, used that in coming through there, but prior to using that channel, they used a channel across the river.

Q. What do you mean, the channel across the river, prior?

A. They used a channel that left Astoria pretty near the center of Astoria, and going directly for what was called the Yellow Bluffs, they used a channel across there. Prior to using that chan-

747 nel, Bill Johnson, one of our first pilots, down there, sounded that out, but Seabury and Latty and Packaman used this

channel across the river. When they would sail up the river, they used that channel across the river. They never went on the inside, but Bill Johnson and Hi Brown sounded out and found this inside channel and run up the inside of what was called Woody Island channel.

Q. Now, about when did they commence to run up there?

A. Oh, I guess that must have been along in '66 or '7, sometime there.

Q. How long did they run there?

A. They run there until, well, seems to me it was a very short time until the time they was changing from one to another. They came in there to sound out, Cordell was on the Massey, he sounded it through and reported there was a channel outside of the one they was running. The one they was running was shallowing up, seemingly, below what they called Brownsport Slough, and he found one outside, they said, was much deeper, and they went around there.

Q. What was that called?

A. They called it the Cordell channel, or Hog's Back channel.

Q. They simply went up around Snag Island and came back into Woody Island?

A. He went north of Snag Island. The other went south and that cut through.

Q. Up to about '66, they were going across from Tongue Point towards the Yellow Bluffs, or from Astoria towards the Yellow Bluffs?

A. Along '64 and '65 there, they run across there, before they found this inside one.

748 Q. Before he found the inside one?

A. Yes, sir.

Q. And then they found the inside channel?

A. Then he found the inside channel.

Q. How long did they use the Cordell channel?

A. Oh, they used it for quite a long time, I can't tell you the exact date they quit.

Q. After they quit using that, what channel did they use?

A. Then we used the north channel altogether inside on the north.

Q. That was the one that run by Pillar Rock?

A. The same old channel they used in '58 or '59.

Q. Then they simply worked back into the old channel?

A. Yes, sir, they worked back into the '58 and '59 channel. The reason they used the inside channel, they thought it was a more direct route to Woody Island. They would come down after going up the river with their vessels, they would come back in a small vessel and they came through that and that was the way they came to find that, because it was a more direct route from Woody Island to Tongue Point, and they sounded out that channel in that way.

Q. You may state, since they went to using the north channel, again there, running across there north of Tongue Point to the

Yellow Bluff country, and into the channel, whether they used the south channel any at all, or not.

A. No, sir, they haven't used it at all.

Q. Neither Cordell nor Woody Island?

749 A. No, sir, neither one.

Q. And the Woody Island channel was not used, as I understand you, except a year or two?

A. It was used only a very short time, a very short time. It shallowed up in below so they couldn't use it.

Q. What was the relative width of this Cordell channel with the channels that they are now using and that they used from '82 up?

A. The channel that they are using now is much wider than the Cordell channel, much wider, but the Cordell channel was wide enough to beat a vessel down through. You couldn't, if a vessel was any length, you couldn't come around with her, you had to back and fill her, you would run her over on one side and she would strike her nose against the sands and you would run her back until she would strike on the other side with her stern.

Q. Could you ever beat down the Woody Island channel south of Snag Island?

A. No, sir, not with those vessels, they never beat down there.

Cross-examination.

By Mr. MACDONALD:

Q. What channel was used in 1867 and '68?

A. In '67 and '68 they was using the Woody Island and the Cordell channels, both at that time, I think.

Q. When did the government first put beacons and buoys on the Washington shore channel?

A. Well, now, it was a long time afterwards; it was a long time afterwards. We had no buoys and beacons. All we had to run by there at the time I run there was our landmarks we had.

750 We had our landmarks so that we knowed where we was.

Q. Up to '67 and '68, the government had never placed any beacons or posts or other aids to navigation along the channel on the Washington shore?

A. Not to my knowledge. They was places on the shores. They had placed marks on the shores.

Q. But those were to be used on the range lines?

A. Some of them would come on the range and some would not.

Q. Now, going down to the lower part of the river, in reference to this middle channel near Desdemona sands, I will ask you if it is not a fact that ever since you have known anything about that portion of the river, the main channel, the one used by oceangoing vessels, has always passed south of Desdemona sands.

A. South of Desdemona sands?

Q. Yes.

A. Oh, no, no!

Q. Has the channel ever been buoyed or beacons been placed upon it by the government north of Desdemona sands?

A. No, sir.

Q. The channel which has been designated on all the government maps, so far as you know, went south of Desdemona sands?

A. Yes, sir.

Q. And ocean going vessels, in coming in from the ocean, on their way to Portland, always passed south of Desdemona sands?

A. No, sir.

Q. When is there——

A. They passed north, they came around the Cape and
751 and sailed direct into Astoria.

Q. North of Desdemona sands?

A. Yes, sir, I have sailed it many times myself.

Q. What was the usual course of vessels coming into Astoria, to pass north or south of Desdemona?

A. It was all owing to the vessel and owing to the wind.

Q. Was there ever a time when ocean going vessels in coming from the ocean into Astoria, pursued a course north of Desdemona?

A. Yes, sir.

Q. If so, when?

A. I couldn't state the year, but I have seen it from where we lived at home there. We could see right out across, and I have seen them come in that way, and when the Desdemona came in, she started that way, but she got too far in towards the shore, and she got aground on the point of the sandbar there, and that was what caused the name of that. We couldn't see her from home, couldn't see her from our house at all.

Q. What years was it in what years did the vessels pursue a course north of Desdemona?

A. That was along in the '50's. There was nothing but very small vessels then, no schooners and sloops and such things as that was built there that came in. Very small vessels.

Q. Then, if a large number of captains and pilots who navigated the Columbia river from Astoria seaward, have testified that the main channel, the main ship channel at that time, and ever since, passed south of Desdemona sands, they are mistaken, are they?

A. They are, to my knowledge, because——

Q. That's enough.

A. Let me answer the question.

752 Q. You can do that on cross examination.

A. I want to answer it on direct examination so I won't get mixed up in this. Mark you, these masters and pilots and these men that have licenses had no licenses at that time and there was none on the river when I am speaking of. It was prior to the time there was any license or anything of that kind granted.

Q. Prior to that time?

A. There was no licenses granted here up to about '66 or '67, I guess, before any licenses were granted on this river.

Q. Then if the government charts and other publications by the federal government show the main ship channel coming from the ocean into the river from '54 and in '58 to pass south of Desdemona Sands, then these charts are not correct.

A. No, I don't say that at all, I say there was a channel south of Desdemona Sands, but I say these vessels that came in, the small vessels that came in came straight from the Cape to Astoria.

Q. I don't care to talk so particularly about the vessels but about the channels. Did you ever make any measurements of the channels to know and determine which was the better and main ship channel?

A. No, sir.

Q. So far as depth and width are concerned?

A. No, sir.

Q. Then your testimony is merely your observation of where certain vessels went?

A. What I have done myself and seen.

Q. You don't desire to be understod as saying that the main ship channel of the river passed north of Desdemona, do you?

753 A. I don't say the main ship channel because we had no buoys and no posts out at that time at all. We sailed straight from the Cape to Astoria.

Q. Wasn't the channel buoyed in '51?

A. No sir.

Q. You are sure of that?

A. No sir, it was not buoyed in '51. I think Kloots was the first man that came there and made any surveys at all. He meandered the river. He didn't sound at all.

Q. Don't the sailing directions of the river for 1854 and 1856, as published by the federal government show the main ship channel to pass south of Desdemona?

A. It may be, I have not examined it.

Q. You have not examined it. Then you don't know as to that?

A. I don't know as to that because I have not examined it.

Q. Do you know where Point Ellice is?

A. I do, sir.

Q. It is a little west and opposite Astoria?

A. Yes, sir, west and opposite Astoria, it is on the north side of the river.

Q. And a little bit west of Astoria?

A. Yes, it would be a little west.

Q. North and west?

A. Yes, sir.

Q. Where is that middle channel that you spoke of with reference to a line drawn from Point Ellice to Astoria?

A. You take it pretty near on a line then and you would have to get off Point Ellice because it would be in deep water around Point Ellice. It has been filled in by the dredger above. It is all

754 filled in but it was well south of Point Ellice that they went through, well south.

Redirect examination.

By Mr. CRAWFORD:

Q. The channel as used in 1850 or along in the fifties, did that run north or south of Miller's Sands?

A. In the fifties?
Q. Yes.
A. North of Miller's Sands.
Q. The channel as used now, does that run north or south of Miller's Sands?
A. North of Miller's Sands.

Recross-examination.

By Mr. MACDONALD:

Q. Did you ever make any measurement of Miller's Sands?
A. No, sir, I never made any measurement of Miller's Sands.
Q. Do you know whether Miller's Sands shifted any since 1851 or whatever that date was?
A. Miller's Sands has gone down the river.
Q. Down the river?
A. Yes, sir.
Q. Do you mean in a westerly direction or a southerly direction?
A. A westerly direction.
Q. What if any direction has it moved with reference to north or south?
A. It has moved a little bit north, a little bit north.
Q. About how much?
A. Probably half the width of the sands.
755 Q. And how wide are the sands?
A. The sands are about—I guess at low water maybe 300 feet.
Q. You think they moved 150 feet?
A. Something like that.
Q. How do you determine that fact?
A. From where I have run, when I was running the scow up and down the river to know where I would strike the sands and strike the shore again.
Q. Have you been running continuously since 1854?
A. Not continuously, but I am on the river every year for a while.
Q. What size steamers did you navigate up and down the river?
A. 500 ton. I have a license to navigate 500 tons. 300 is the highest I have ever had.
Q. What size boat did you usually navigate most of the time?
A. The smaller boats running there, you might say 35 up to 125 tons.

Witness excused.

756 GEORGE KABOTH called as a witness on behalf of the defendant, after being first duly sworn testified as follows:

Direct examination.

By Mr. A. M. SMITH:

Q. Mr. Kaboth, state your name, age, occupation and place of residence.

A. George Kaboth, age 45, residence Astoria, Oregon, seining business.

Q. How long have you lived in Oregon?

A. Since 1883.

Q. State whereabouts you have lived.

A. I have lived from 1883 in the neighborhood of Woody Island, Brookfield, and Woody Island Slough, from '83 to about 1890, continuously almost.

Q. Where have you lived since 1890?

A. In Astoria, Oregon.

Q. Will you state whether or not you have any interest in any sands in the vicinity — Snag Island?

A. I have.

Q. How did you acquire these sands?

A. I bought a certain sand island that I used for fishing purposes from the state of Oregon about the year 1897 or '8. I haven't had time to look up my deeds so I am not certain. In 1896, '97 or '98, but probably in 1897.

Q. How often have you been on those sands?

A. Every year during the summer time and sometimes the fall of the year.

Q. Have you made it or have you carried on any business there?

A. I did.

757 Q. What business?

A. Catching salmon with a seine.

Q. Have you paid taxes on this ground?

A. Yes.

Q. To what state?

A. The property is described on the assessment roll of Clatsop County and assessed to me the same as any other property.

Q. Have you paid or have the Washington officials ever made any attempt to collect taxes from you on this ground?

A. No, sir.

Q. Have you paid taxes to any other state excepting Oregon?

A. No, only Oregon.

Q. Now, Mr. Kaboth will you state whether or not you are familiar with the channels in that vicinity of Snag Island from '83 to '90?

A. I am.

Q. And up to the present time?

A. I am.

Q. Will you state which channel was the widest channel when you first became familiar with those channels, which was the wider

channel as between the channel running north of Snag Island and the channel running south of Snag Island?

A. The channel north of Snag Island was always considered the best cannel.

Q. Describe to what extent you are familiar with those channels and how you became familiar with them?

A. I lived right at Woody Island and finished with gill nets before I commenced seining, and some time even after I had seining operations going, in the spring of the year, in order to fit
758 out nets, to fit out nets for that purpose I sounded and measured the grounds to be fully acquainted with the depth and the width of the channels in order to make the nets for fishing.

Q. State whether or not you ever drifted with any nets through either the Cordell channel that run north of Snag Island or the Woody Island channel that run south of Snag Island?

A. Yes, when I fished with gill nets we used to lay out our nets at Woody Island about two miles above Brownsport Slough and our nets would go down south, in a southerly direction towards Brownsport, and then swing into Cordell channel. That was when the most volume of water was going in down the river.

Q. How long were the nets that you used?

A. About 300 fathoms.

Q. Can you state about how many times you drifted through either of these channels with a net?

A. Well, I fished there for several years and then several months in the year and then several times every day and several times the next day. Many times. Whenever we fished we kept on fishing there. I fished there in the fall of the year and I fished there in the summer.

Q. From your observation were you able to determine which channel was the wider channel, as between the channel running north of Snag Island and the channel running south of Snag Island?

A. Without a doubt the channel running north of Snag Island was the widest channel.

Q. Did you ever have any opportunity to determine the relative condition of the channels with reference to their depth and
759 the volume of water in the channels?

A. There was a more uniform depth of water in the Cordell channel as there was in the old Snag Island channel, the south Snag Island channel. The channel that run south of Snag Island. The Woody Island channel, there was a more uniform depth in the Cordell channel as there was in the Woody Island channel. The Woody Island channel would be a mere succession of flats and holes and shallows, and it was not as satisfactory for fishing as the other one.

Mr. MACDONALD: You speak of it for fishing.

A. It was for that purpose I sounded. Yes.

Q. Mr. Kaboth, when did your sands that you have testified about first form in the river when you purchased them from the state of Oregon?

A. During—after—after I think it was, 1904, it formed in about 1895, between 1894 and 1895.

Q. Have those sands remained the same since you purchased them from the state of Oregon?

A. They have with a little exception. They—I built a house on that sands and that gives me a sure way of knowing that there has been no perceptible change made in any other way excepting towards the north there is the last two or three years, there has been a little accretion to the north of them, that is from what I originally surveyed and applied to the state of Oregon to purchase. There is a little accretion towards the north.

Q. Do you know where the channel that runs south of Snag Island passed Snag Island in the year 1883 and in the eighties, with reference to your sands?

760 A. The old Woody Island channel?

Q. Yes.

A. The Woody Island channel, that is the south channel. The south channel came up close, close to the deepest water. That was a place up on the head of Snag Island, and to the south of Snag Island, near to the head of Snag Island.

Q. How did that channel run with reference to where your sands are now located?

A. In a northerly direction.

Q. Now, Mr. Kaboth, have you had any opportunity or do you know of your own observation where the ships and vessels of commerce have passed up and down the river during the last years or since 1883?

A. They never sent a vessel, a sailing vessel or a vessel of any larger size past Snag Island, either on the north or south since 1883.

Q. Do you know where they have gone?

A. They all went up what was called Tongue Point channel and up to Harrington Point and along Miller's Sands, on the north of Miller's sands, then went over in a southeasterly direction. They came away quite a ways from the Washington shore and then went back again towards Three Tree Point.

Q. Did those vessels all pass, did they pass north of Miller's Sands?

A. Yes.

Q. And what direction did they pass Pillar Rock?

A. They came in, between '83 and up to about '96, in the early nineties, vessels came there past Miller's sands and then struck out in a southeasterly direction towards a certain sand bar com-

761 monly called the Sam Oliver Sands, and then took a turn and went back over again to the Washington shore over to the Jim Crow Point.

Here a recess was taken until 1:30 P. M. today, September 14, 1906.

PORTLAND, OREGON,
FRIDAY, *September* 14, 1906—1:30 o'clock p. m.

Taking of testimony resumed pursuant to recess, all parties present.

GEORGE KABOTH called for further direct examination:

By Mr. A. M. SMITH:

Q. Mr. Kaboth, do you know what the distance is from the south side of your sands to the shore of Channel Island or Woody Island, south of your sands?

A. It is about 1800 feet.

Q. Do you know about what the distance was across the Cordell channel, when you first became familiar with it?

A. I should think about twice that length.

Q. Are you familiar with the river opposite Jim Crow point, between Jim Crow Point and Woody Island?

A. Yes, I am.

Q. Do you know when the sands known as the Enyert Sands, directly south of Jim Crow Point, were formed in the river?

A. Yes, I remember.

Q. What year were they formed?

A. Well, it is hard to say what year they were formed because they are formed gradually.

Q. Well, do you know what year it was that they first
762 emerged above the low water mark?

A. About '87.

Q. Do you know whether there were any other islands in that neighborhood at the time?

A. Not between Island and Jim Crow Point.

Q. Do you know what their position was when they were formed with reference to Jim Crow Point and Woody Island?

A. They were very near or close to Woody Island with a narrow and small body of water lying between it and Woody Island.

Q. Have you had occasion to see those sands since that time?

A. I had very often, yes.

Q. How often?

A. Oh, pretty near every year.

Q. Do you know whether they remained in the same position or changed?

A. They are about in the same position.

Q. What is the greater distance, from those sands to Jim Crow Point or from those sands to Woody Island?

A. The distance between the sands and Jim Crow point is at least three times as long as between the sands and Woody Island.

Q. What is the character of the country south of the channel that runs south of Snag Island?

A. The channel south of Snag Island?

Q. What is the character of the country immediately south of the channel that runs south of Snag Island, what is the character of the land?

A. Why, it is almost a continuation of sand bars with a little small——

763 Q. (Interrupting.) I mean south.

A. Opposite my seining ground?

Q. Yes, towards the island from that.

A. Why, it is rather grassy islands, grassy islands with some brush and trees growing on it.

Q. What kind of trees?

A. Oh, there is all kinds of trees there, spruce, tide land spruce, alder, in fact all kinds of trees there. They are too numerous to mention.

Q. Now, Mr. Kaboth have you paid license fees for operating your seins, state whether or not you have paid any license fees for operating your seins on those grounds?

A. I have always paid my license fee to the fish warden of the state of Oregon.

Q. State whether or not you ever paid to the state of Washington.

A. I was never asked to pay to them.

Cross-examination.

By Mr. MACDONALD:

Mr. MACDONALD: We do not think this testimony is at all material so we will not cross examine, we don't think it touches any of the issues in the case.

Witness Excused.

764 Captain W. A. BETTS called as a witness on behalf of the defendant after being first duly sworn, testified as follows:

Direct examination.

By Mr. CRAWFORD:

Q. Captain, you may state your name, age, residence and occupation?

A. W. A. Betts—B-e-t-t-s.

Q. Age?

A. 65, residence Astoria, for the time being. Occupation pilot.

Q. How long have you been a pilot?

A. Since '81.

Q. And the scene of your operations has been on what waters?

A. Between Astoria and Portland.

Q. On the Columbia River?

A. On the Columbia and the Willamette.

Q. You may state, Captain, whether you are familiar with the route that is used from Tongue Point across to Yellow Bluffs or Harrington Point?

A. Well, when I came first or now, which is it?

Q. Both.

A. Well, when I came first the channel was the Cordell channel

and it run to the northern of Snag Island up to—what was the name of the place? Swansport?

Q. Brownsport, do you mean?

A. Brownsport, from Brownsport over to Jim Crow. That was the first year, in '81. In '82 it was changed.

Q. And where did it change to?

765 A. It changed from what we call the Snag Island channel over around Pillar Rock channel. We came out from Jim Crow and then turned on the outside of Pillar Rock and ran down to the north of Miller's Sands.

Q. Now, Captain, you may state whether that is the first that you ever knew of there being any channel across there north of Tongue Point to Yellow Bluff and the north channel?

A. Over towards Harrington Point, you mean?

Q. Yes, to Harrington Point.

A. No, up to that time it had never been run by ships. Mind you, I am talking about large ships and not stern wheel boats, ships drawing from 15 to 20 feet of water. I know nothing about where the stern wheel boats go. The probabilities are they can go all over the river from bank to bank, almost, but the ship channel, what we call the ship channel has been, as I said, since I have been there, since '81.

Q. Now you may state whether you have been informed of there being a channel across from Tongue Point to Harrington point prior to the time you came here?

A. No, there was none because we sound this river out after every freshet in a year.

Q. I don't mean since you came here, I mean prior?

A. Oh, prior to that?

Q. Yes.

A. Oh, I have heard older hands than me state that they went up the Woody Island channel. They used to go up the Woody Island channel in the early days with light draft vessels.

Q. But across to Tongue Point?

A. To Harrington Point?

Q. Yes.

766 A. No, I have never heard any statement to that effect. I think it was in '82 that they first crossed there.

Q. Now, the commerce has always been north since you have been here, of Miller's Sands?

A. Ever since 1881.

Q. And even in '81 it was north of Snag Island?

A. Yes.

Cross-examination.

By Mr. MACDONALD:

Q. Are you in active service at the present time?

A. No, not at the present time, I am here with you gentlemen, but outside of that I am.

Q. In other words, your occupation at this time is that of a pilot?

A. Yes, sir, piloting ships up and down the river.

Q. What class of ships do you pilot up and down the river, Captain?

A. Well, ships all the way from 75 to 6,000 tons or less, anything we can get.

Q. That is you take ocean steamers in and out?

A. Ocean ships and sailing ships and anything of that sort.

Q. Are you familiar with the dredging which has been done between Yellow Bluffs and Tongue Point?

A. Yes, sir.

Q. In recent years?

A. Yes, sir.

Q. That has had a tendency of course to increase the depth and width of the channel and produce a greater flow through there?

A. Certainly, certainly.

767 Q. The same is true of the dredging done in the vicinity of Pillar Rock?

A. The same.

Q. And as I understand it the channel, before that dredging was done near Pillar Rock ran south of Pillar Rock?

A. Ran south of Pillar Rock.

Q. And since the dredging it has run south of the main land?

A. That is correct.

Q. When did you say the Cordell channel ceased to be used?

A. Well, as near as I can place it about the middle or latter part of '82.

Q. Would you be positive that it was '82?

A. Yes, very positive, I should think.

Q. You think the middle or latter part of 1882?

A. Yes, sir, I think somewhere about that.

Q. Do you know of your own knowledge when Woody Island channel ceased to be used?

A. Woody Island, I never went through Woody Island.

Q. Your service commenced in '81?

A. In '81, yes.

Q. So that then Woody Island channel was not used by the ocean steamers?

A. No sir.

Q. Were you ever a bar pilot?

A. Yes, a Washington bar pilot?

Q. When were you a Washington bar pilot last?

A. Well, in '81.

Q. Since that time have you taken out licenses from Washington or just from Oregon?

A. Just from Oregon.

768 Q. You don't take out a license for Washington?

A. No, not any more. I don't take out any from Oregon, either, nothing only from the general government. Since they done

way with compulsory pilotage I have had nothing more to do with ilot Commissions.

Redirect examination.

By Mr. CRAWFORD:

Q. Captain, you don't know, do you, whether they went north of illar Rock some before they dredged north of Pillar Rock?

A. Well, oh yes, we went north of Pillar Rock before they dredged. hey don't do any dredging on this river unless we call on them do it. Wherever they dredge on this river it is where we call on iem for to do so. The pilots on the river they do. Of course, Mr. legardt is here and he knows a great deal about it. We do the ounding after every freshet in the river in the ship channel, and we nd places that are filling up in the channel and we notify the Port Portland Commission, or whoever it may be, sometimes the nited States engineer, and they send the dredger and clean out the mpediment.

Q. Wasn't the dredging done north of Pillar Rock mainly for ie purpose of lowering that so that vessels could go through at low de in order to catch the bar at high tide and not lose time.

A. That is the proposition, to deepen the river so that there will e no stoppage for tides.

Recross-examination.

By Mr. MACDONALD:

Q. In all the years since you have been on the river, you have bserved frequent changes in the channels, have you not?

A. Well, there has been no great changes materially in
59 the channel between here and Portland, only down here at this lower end. There has been none, only the filling up of ie cuts.

Q. There is a great deal of filling between these dredgings?

A. Oh yes.

Q. And you constantly have to take soundings?

A. Yes, certainly.

Q. And constantly have to call on the dredgers to open up chan-els that are filling in.

A. Yes, sir.

Q. And if it were not for the dredging of these channels some of iem would fill up so they could not be used?

A. Yes, sir.

Q. It is necessary then to keep dredging all of the time to keep ie channels open, or to keep the same channel open at least.

A. Just as necessary as it is in any part of the world. There is o port in the world but what you have got to employ so many redgers, even in Seattle.

Q. You live in Oregon, I understand?

A. Well, I can't help it. I would live in Paris if I was able.

Witness excused.

Mr. CRAWFORD: Counsel for the state of Oregon offers in evidence certified copy of the plat compiled by the United States engineer's office in Portland, showing the mouth of the Columbia River, showing the location of Sand Island in '52, '68, '65 and 1905, and ask that it be marked Oregon's Exhibit No. 16.

770 Mr. MACDONALD: I assume it is signed by Colonel Russell.

Mr. CRAWFORD: Yes, that is right.

Mr. MACDONALD: No objection.

Map marked Oregon's Exhibit 16 and signed by the Commissioners.

GEORGE SCOGGIN called as a witness on behalf of the defendant, after being first duly sworn, testified as follows:

Direct examination.

By Mr. A. M. SMITH:

Q. Mr. Scoggin, what is your occupation?

A. Civil engineer and surveyor.

Q. How long have you been engaged in that business?

A. About 12 years.

Q. Where do you reside?

A. Portland, Oregon.

Q. Will you state whether or not you ever made a survey of the Enyert sands opposite Jim Crow Point in the Columbia river?

A. I have.

Q. What time did you make this survey?

A. I made two surveys. One in 1900 and in 1901, around there.

Q. State whether or not you made any survey with reference to the Oregon shore and with reference to the Washington shore.

A. Well, the point of connection was with the Washington shore.

771 Q. Did you go over the work at that time that was made by others to see whether it was correct?

A. I did.

Q. Just refer to this map I now hand you, Oregon's Exhibit No. 15, and state whether or not you know or have ever seen that map before.

A. Yes, that is the map that I checked over for Mr. Elliott and Mr. Habersham.

Q. State whether or not that was used in evidence in a case that was pending in the Oregon courts at that time.

A. Yes, it was.

Q. State whether or not that map shows the location of the Enyert sands.

A. It does.

Q. Will you state whether or not the distances given on that map and laid down on that map are correct?

A. They are, so far as our survey is concerned. Of course, those

made prior to the time of the survey that we made were of course uncertain. We couldn't tell.

Q. I mean, as to the condition of the sands at that time.

A. They were, they represent the condition of the sands at the time the survey was made.

Q. State whether or not they represent the location of the sands at that time.

A. They do.

772 Cross-examination.

By Mr. MACDONALD:

Q. Did you prepare that map yourself?

A. I did not.

Q. Who did prepare it for you?

A. It was prepared by Richard Haversham, of Astoria.

Q. How do you know it is correct?

A. Well, I went over the work and took the angles as we had them laid down in the notes, and re-calculated the map, and re-platted it.

Q. Did you make an independent survey yourself?

A. I did, yes.

Q. Of everything shown on the map?

A. Of the surveys shown on here made by Haversham.

Q. Can you testify that that map is accurate in all particulars from the survey made by yourself?

A. It is; yes sir.

Q. When did you make that survey?

A. The first survey I made was in 1900. I believe this map was made in 1901.

Q. This map was made from a survey in 1901, that is the last survey made, shown on this map.

A. Yes sir. Probably it might have been 1902.

Q. What is this, a section corner? (Indicating.)

A. That is a meander corner on the section line.

Q. You made a measurement from here to the sands?

A. Yes sir; it ties. That was done by means of triangulation.

Q. What do these various colored lines upon that indicate?

A. Well, they were the probable locations of the sands at
773 different times in different years.

Q. Did you make those measurements so that you can swear they are accurate?

A. No, not all these. These are put on from the United States charts to show the relative location of the sands as they existed at some other time or some prior surveys.

Q. You cannot swear to the accuracy of those lines?

A. I can swear that they are there according to the notes of the prior surveys.

Q. You made no survey of those lines?

A. No.

Q. Then you can't swear that they are true?

A. I can't swear that those lines existed there at that time, but what I mean to say is, that from the notes given of these prior locations of the sands, they existed in the same relative location.

Q. You simply take the notes made by others?

A. Of those different colored sands, yes.

Q. Then the only thing you can testify to from your own knowledge are these two lines from the main land to the islands?

A. Yes, and the location of these sands in here (indicating).

Q. The location of which sands?

A. Well, this was the one right down here, (indicating).

Q. What color is that?

A. That is—No, it is the one right here, this brown one, right in here.

Q. I wish you would put some figures on there so we can determine it.

774 A. Well, it is indicated on there by the meander number 5794 feet south.

Q. This is the only one you know of your own knowledge which is accurate, this one in here? (indicating).

A. That was the one that was surveyed last, yes.

Q. This one right here, (indicating).

A. Yes.

Mr. Macdonald:

Q. I wish you would permit the Commissioners to put the figures 1, 2, 3, 4, 5, 6, 7 and 8, there, so we can describe it.

Mr. Crawford: All right.

(Figures placed on the map by the Commissioner.)

Q. Commissioner Reynolds has just placed upon this map the figures 1, 2, 3, 4, 5, 6, 7, and 8, enclosing a tract of land upon this island. As I understand it, that is the only measurement that you have made with reference to the exterior lines of the sands.

A. No, it is not.

Q. Well, what other one have you made?

A. Well, I made one.

Q. Before that, let me ask you, did you make that one?

A. Yes.

Q. When?

A. That was the last one. That did not include the whole area of the sands though, at that time.

Q. What did it include?

A. It was simply to locate any particular points in reference to this house and this piling right here, (Indicating).

775 Q. That does not purport to include the entire sands?

A. It does not; no sir.

Q. You did, however, make that measurement?

A. Yes sir.

Q. Did you ever make a measurement which included the exterior lines of the entire sands?

A. Yes, I did that also.

Q. When?

A. About a year previous to that.

Q. I wish you would mark those lines commencing with the figure 9.

A. Well, I can't identify which one of these was according to my survey now.

Mr. A. M. SMITH: Was it the one that the Washington deed was issued to Enyert upon?

A. Yes, I believe that was the one, yes, about 1900. My impression was that it was this one.

Q. Just mark it then, please.

A. How do you want it?

Q. Commence with the figure 9. You have already used 8.

A. Mark at every angle?

Q. Yes, just so we can describe it accurately.

A. (Witness places numbers on the map.) Yes, that is it, I remember it now.

Q. The survey then that you made is along the line from which the figures 9 to 24 inclusive, appear?

A. Yes sir.

Q. And that survey shows the exterior lines of those sands at the time of your survey?

A. Yes.

Q. When was that survey made?

776 A. Well, I think it was in 1900. It might have been in 1889.

Q. Now, when did you make the survey of those lines from 1 to 8, with reference to this last survey, before or after?

A. That was afterwards.

Q. Have you made any survey since?

A. I have not.

Q. You don't know, then, whether these other lines which did not coincide with this survey of lines 9 to 24, are correct or not?

A. No.

Q. Did you see those sands on more than the two occasions that you have mentioned as having made a survey?

A. Oh, yes, I have seen them at various times in passing by.

Q. Have you been upon them?

A. I have only been upon them twice.

Q. Just the two times?

A. Yes.

Q. You don't know whether this last survey made by you is correct, as to the condition of the sands at the present time?

A. No, I couldn't tell.

Q. You don't know what changes have occurred, if any, in the situation there?

A. I do not; no sir.

Q. Did you make an actual measurement from the Washington shore to Woody island or to the Oregon shore?

A. Well, that is an actual measurement by triangulation.

Q. Did you make it?

777 A. Yes sir.

Q. You made it personally?

A. Yes sir.

Q. You know it is correct from the Washington shore, do you?

A. Yes sir.

Q. When did you make that survey?

A. Well, both those connections were made at the time the separate surveys were made, in 1900 and 1901, say about that time.

Q. You made a survey from the section corner of 15, 16, on the Washington shore to the section corner of 21, 22, 23, 27 and 28 on the Washington side.

A. That corner (indicating), does not exist. It comes in a slough, They were never able to find it.

Q. What point on the Washington side have you tied to this section 15, 16, on the Washington?

A. Well, there is no particular government corner or anything of that sort.

Q. What do you tie to so that you are able to tell the exact distance?

A. Well, this corner was put in by platting it.

Q. How did you arrive at the location of that corner?

A. Well, the field notes of the government survey called for the corner to be located at this certain particular point.

Q. How far from the Oregon shore?

A. Well, it was in a slough.

Q. Then how——

A. This is Oregon here. It was in the slough.

778 Q. Then you relied on the government notes for that?

A. Yes.

Q. Then you did not make an independent survey?

A. With reference to Oregon?

Q. Yes, to determine the distance between the Oregon shore and the Washington shore.

A. Yes, we did that also.

Q. Well, what initial point did you take in Oregon?

A. The section point we took in Oregon is down below, it don't show on this map.

Q. It don't show on this map?

A. No. There is another map that does show the main corners, that is about six miles away.

Q. Did you make a survey from Jim Crow Point to the sands?

A. We located those points.

Q. Did you make a survey?

A. We had a triangulation upon Jim Crow.

Q. Will you swear this is the exact distance from Jim Crow Point to the nearest point of the sands?

A. That is the distance platted, there is no figures given on this

Q. There is a scale on this.

A. Yes sir.

Q. Scaling it from Jim Crow point to the nearest point on the sands, according to the distance given on this map, would that give the exact and accurate distance?

A. Yes sir, according to the distance.

Q. You are positive of that, are you?

A. Yes sir.

779 Q. How far north of Woody Island is the nearest point of those sands?

A. Well, I should judge they are about——

Q. I want you to give me accurately, if you know.

A. Well, I don't know.

Q. Can't you scale it from the scale?

A. I have no scale here.

Q. Will you refer to Washington's Exhibit I, and tell us whether those sands are north or south of the red line appearing on them?

A. Well, I will have to have a scale to determine that.

Q. Can you by using a piece of paper, and measuring the scale as printed on that map, arrive at the distance?

A. That channel line would come a little south of the line indicated by the north boundary of the sands, indicated by the figures 9 to 24.

Q. I don't quite understand. Are the sands south or north of that red line?

A. They are mainly south.

Q. Does the red line go through them?

A. It would probably touch the sands on the north side.

Q. Can you give us that absolutely accurate and definite?

A. Well, I can't without a scale, no, but as near as I can scale it, though.

Q. From the distance given on your map, the red line goes through it.

A. Yes, that red line goes through it.

Q. It would touch along the north line of those sands?

A. Yes, sir.

(Witness excused.)

780 Mr. MACDONALD: I would like to recall Mr. Kaboth for further cross examination.

GEORGE KABOTH recalled for further cross examination, testified as follows:

By Mr. MACDONALD:

Q. The State of Washington has heretofore issued you a contract for the sands mentioned in your testimony this morning?

A. Yes, sir.

Q. Do you recall the date of that contract?

A. Not exactly, but about 6 years ago.

Q. You have not made all the payments as yet?

A. No, sir.

Q. Is the contract still in force?

A. I think so.
Q. You have made all the payments that are due on it?
A. Well, no, I haven't paid anything lately.
Q. You have made several payments, have you?
A. I have.
Q. Those payments mature annually?
A. Yes, I believe so.
Q. One payment a year?
A. Yes.

(Witness excused.)

781 Captain W. H. WHITCOME called as a witness on behalf of the defendant, after being first duly sworn, testified as follows:

Direct examination:

By Mr. CRAWFORD:

Q. State your name, age, residence and occupation.
A. W. H. Whitcome, age 55; East Portland. Steamboat captain and pilot.
Q. How long have you been a steamboat captain?
A. Well, I have had my master's papers since '77. I had mate's papers in '74.
Q. Where have you operated steamboats during that time?
A. Astoria to Portland, Cascades and Oregon City.
Q. On the Columbia river?
A. Yes, sir, Columbia and the Willamette.
Q. You may state whether you are familiar with the Columbia river in the vicinity of Cordell channel and Jim Crown Point.
A. Yes, sir.
Q. How long have you been familiar with that?
A. Ever since I had my mate's papers, '74, and captain's in '77.
Q. Look at this map, called Oregon's Exhibit No. 8, and state whether or not the main channel of commerce of the Columbia river ever passed between what is called Enyert Sands, south of Jim Crow Point, the same being marked on this plat with the name "Charles Wood, F. Cook and Woody Island?"

782 A. Up through here, (indicating).
Q. Yes, sir.
A. No, sir.
Q. When Cordell channel was used, you may state whether the channel was north or south of those sands, now called Enyert sands.
A. It was north, on the north side.
Q. You may state whether from your acquaintance with the river, large ships, vessels, or sea going vessels of any size, passed through what is called Woody Island channel, south of Snag Island.
A. South of Snag Island, no, sir, there was never any passed there since I recollect.

Q. Where did they pass?
A. On the north side, over around the head of Woody Island and then turned north.

Cross-examination.

By Mr. MACDONALD:

Q. How do you know that the channel is north of Enyert sands?
A. I knew it by lining it, throwing the lead and running it, that is the way I learned it, the same as anyone else.
Q. Which channel do you mean, the Woody Island channel or the present channel?
A. The Woody Island at that time.
Q. When did you use the Cordell channel?
A. Until they built the jetty and stopped us out.
Q. When was that?
783 A. '92, I guess, 1891 or '92, somewhere along there.
Q. When did they commence the construction of that jetty?
A. I can't tell the exact time, '91 or '92.
Q. Did you ever use the Woody Island channel?
A. Which side?
Q. There is only one.
A. The Cordell channel?
Q. Yes.
A. I used it until they built the jetty and that shut us out.
Q. Did you say you have used the Woody Island channel since the building of the jetty?
A. No, sir.
Q. Where is the jetty, does it go across Woody Island channel?
A. It is open there at present. It runs southwest and makes a turn on the south side of it.
Q. Doesn't it go across Woody Island channel?
A. The one we used, the Cordell channel, it shut that off.
Q. You understood there were two channels, Cordell channel and Woody Island channel.
A. Yes, sir.
Q. One of which goes north of Snag Island and the other south?
A. Yes, sir.
Q. Now, when did you use the south channel last?
A. The last time I used it, I was working for the government, on the Lincoln, that was the last time I used it.
784 Q. When was that?
A. After the jetty was built a little while.
Q. Fix the year if you can.
A. I can't exactly tell, 1891, I think, or 1892, I can't tell exactly.
Q. Are you in active service at the present time as a pilot?
A. Yes, at the present time I am on the fireboat the George H. Williams, and I have been for two years.
Q. Previous to that, where were you running?
A. I worked two years on the Cascades and towing barges, and I have been on the fireboat since then.

Q. What other boats have you been on?

A. How do you mean?

Q. Between Portland and Astoria, other than those operated by the government?

A. Been on the Lurline and the John McCracken.

Q. Have you been a pilot on deep sea vessels between here and Astoria?

A. Not lately, sometime ago.

Q. How long ago?

A. About 8 years ago and then 4 years before that, I was constantly working for the O. R. & N. Company.

Q. The Lurline is a sternwheeler?

A. Yes, sir.

Q. What is the McCracken?

A. A tugboat.

Q. What water does she draw?

A. Nine feet or eight feet and a half.

785 Redirect examination.

By Mr. CRAWFORD:

Q. What were you doing down there with the Lincoln?

A. They built the jetty, and then they had the dredger there for a few days, and then I was around there as a tender.

Q. What were they trying to do?

A. I don't know what they was trying to do, digging around there and surveying. I was working for the government at that time, on the Lincoln.

Q. You was not piloting vessels through there at that time?

A. No, sir.

Q. You may state whether you mean 1892 or 1882. It has been testified by the other witnesses that it has been abandoned, the Cordell channel as a ship channel since 1882, and they came up from Tongue Point to Harrington Point.

A. Yes, sir.

Q. I understood you to say '92.

A. I might have said '92.

Q. What was it?

A. I don't know which it was; I can't recollect whether it was '92; it was either '92 or '82, it might be '82.

Mr. MACDONALD: What date was that?

A. That the jetty was built. It was finished in '92, I think.

Q. Wasn't the shipping mostly going up from Tongue Point across to Harrington Point at that time, in '82?

A. Very seldom.

Q. Other pilots have testified that about '82 the shipping
786 changed and the heavy shipping went up to Harrington Point?

A. After they started in to dredge it out. The channel was there all the same, and they found a new channel, they went down there one day and found a new channel and reported it to the

pilots and Captain Pease went and sounded it out and found a better channel, and from that time on, they went over that channel.

Q. The time that Captain Pease went out there?

A. Yes, sir, that was about the time the jetty was finished. I couldn't say exactly the date.

Q. Probably Captain Pease, if he has testified and testified to the dates, he would be correct?

A. Yes, sir.

Recross-examination.

By Mr. MACDONALD:

Q. How do you know Captain Pease was correct in his statement?

A. I know he was, because he — one of the most responsible men on the Columbia river.

Q. You don't think it would be possible for him to make mistakes?

A. No, sir. There isn't a man on the river who can come up to him. He would be correct in his testimony.

Q. How do you know that?

A. Because I have seen him put it down in his books.

Q. If he testified from memory, don't you think he could make a mistake?

787 A. He could, certainly, but I am saying Captain Pease is thorough. There ain't a more thorough man that Captain Pease anywhere.

(Witness excused).

Here an adjournment was taken until 11 a. m. tomorrow, September 15th, 1906.

PORTLAND, OREGON,
SATURDAY, *September* 15, 1906—11 o'clock a. m.

All parties present.

By stipulation a recess was taken until 1.30 o'clock today.

1.30 O'CLOCK P. M.

Taking of testimony resumed, pursuant to recess; all parties present.

788 W. H. PATTERSON called as a witness on behalf of the defendant, after first being duly sworn, testified as follows:

Direct examination.

By Mr. CRAWFORD:

Q. State your name, age, residence and occupation.

A. My name is W. H. Patterson. I will be 48 years old the 4th day of November. I am a pilot on the Columbia river. Residence 782 Lovejoy street.

Q. Portland?

A. Portland, Oregon; yes sir.

Q. State, Captain, how long you have been a pilot on the river.

A. Well, I have — piloting vessels for 25 or 30 years here. I was on the San Francisco steamers 15 years steady.

Q. Your business, then, is a pilot on the Columbia river?

A. Yes sir.

Q. And it has been continuously?

A. Yes sir, continuous.

Q. Is it your business at the present time also?

A. Yes sir.

Q. You may state, captain, where the main channel of commerce has been in that section of the river between Jim Crow Point and Tongue Point during your time on the river.

789 A. All the time I have been operating on the Columbia river, it has been between Pillar Rock and Tongue Point, and one time, for several years, we run just this side of Pillar Rock, southern of Pillar Rock and after that we run in north of Pillar Rock.

Q. You may state whether, during that time, vessels have run south of what is called Enyert sands, or Snag Island.

A. Not to my knowledge, no. Never have been through there with nothing more than a fishing boat or a steamboat. Never with a deep draught vessel of any kind.

Q. You may state what has been the relative width of that channel which you testify has been so used, as compared with other channels in that vicinity, of the river.

A. How do you mean, the width of the river?

Q. Yes sir, that is, which is the widest and has been during your acquaintance with the river there.,

A. Well, the best channel we had was down inside of Pillar Rock. I went through Pillar Rock with a ship drawing 26 feet when you couldn't go out the other way with one drawing 22 feet, and then we would have to have the tide to go down with it.

Q. Now, which has been the widest?

A. The Pillar Rock channel.

Q. You may state what you mean by the Pillar Rock channel.

A. Well, it is down inside of Pillar Rock, on the Washington shore.

Q. Between Pillar Rock and the Washington shore?

A. And the Washington shore, yes sir.

790 Q. How far does that follow along the Washington shore before it leaves the shore?

A. Five miles, it is exactly five miles from Pillar Rock to Harrington Point when we start across the bay.

Q. Towards what?

A. Towards Tongue Point.

Cross-examination.

By Mr. MACDONALD:

Q. Captain, you began your services as a pilot on the river about 1881.

A. Yes—Oh, long before that.
Q. Long before 1881?
A. Yes.
Q. When?
A. Well, about '77 or '8. I was running mate quite a number of years between '74, '75, '76 and '77.
Q. During your service on the river, did you ever use Cordell channel?
A. No sir, I never did.
Q. Never used that at all?
A. I never did.
Q. There has been considerable dredging done by the government next to the Washington shore in the vicinity of Pillar Rock?
A. Well, there has been a little dredging done down inside of Pillar Rock.
Q. Do you know what the ruling depth of the channel was before the dredging was done between Jim Crow Point and Tongue Point?
A. A little over twenty feet.
791 Q. The ruling depth was 20 or 21 feet?
A. Yes sir, there was more inside of Pillar Rock.
Q. Do you know what the ruling depth of the channel was inside Jim Crow Point up to Snag Island?
A. No, I don't.
Q. It was about 25 feet?
A. No, you couldn't get it away up there, it would go about nine or ten feet.
Q. I mean, up to Snag Island.
A. No, you couldn't go to Snag Island and get that.
Q. You made no measurements there?
A. We used to sound.
Q. If the government reports say that in '91 the ruling depth there was up to 25 feet, they would be correct?
A. I don't think so.
Q. You should say those reports are inaccurate?
A. We always found them so.
Q. You found the government surveys usually inaccurate?
A. We can never get within two feet of what they can get. They get two or three feet more water than we get.
Q. Do you say, as a general thing, that the government reports are usually inaccurate?
A. Yes, I should say so, at least, we always found them that way.

(Witness excused.)

792 Mr. CRAWFORD: We have nothing further.

Stipulation.

It is hereby mutually agreed and stipulated, by and between the attorneys for the respective parties hereto, that either party may produce and file with the Clerk of the Supreme Court in this case, duly certified copies of any public records whatever, which they deem

pertinent or competent as testimony, and that in that event a copy thereof be served on the opposite counsel.

We respectfully ask that the Court grant and observe this stipulation.

793 In the Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
v.
STATE OF OREGON, Defendant.

Oath of Shorthand Reporter.

STATE OF OREGON, *County of Multnomah, ss:*

I, John H. Pelletier, do solemnly swear that I will support the Constitution and laws of the United States; that I will truly, faithfully, and correctly report in shorthand writing and transcribe into typewriting all the testimony and proceedings in this cause, wherein the State of Washington is complainant and the State of Oregon, defendant. So help me God.

J. H. PELLETIER.

Subscribed and sworn to before me this 13th day of September, 1906.

C. C. DALTON,
Commissioner on the Part of the State of Washington.

794 In the Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
vs.
STATE OF OREGON, Defendant.

Certificate of Shorthand Reporter.

UNITED STATES OF AMERICA,
State of Oregon, County of Multnomah, ss:

I, John H. Pelletier, do hereby certify that I was appointed by the respective parties to the above entitled cause, to report the testimony and proceedings therein; that I was present at the examination of all of the witnesses on behalf of the defendant, as herein set forth; that I made in shorthand writing a complete and accurate report of the proceedings and of the testimony of all of such witnesses, and that the foregoing pages are a complete and accurate transcript of my shorthand notes taken therein.

J. H. PELLETIER.

Dated at Portland, Oregon, September 17th, 1906.

795 In the Supreme Court of the United States.

STATE OF WASHINGTON, Complainant,
vs.
STATE OF OREGON, Defendant.

Commissioners' Certificate.

UNITED STATES OF AMERICA,
State of Oregon, County of Multnomah, ss:

I, C. C. Dalton, and I, John W. Reynolds, do each hereby certify that said C. C. Dalton now is and at all the times since the 10th day of July, A. D. 1906, has been, a Notary Public duly commissioned by and for the State of Washington, and that said John W. Reynolds is now and at all times since the 10th day of July, 1906, has been, a Notary Public duly commissioned by and for the State of Oregon.

That both of us, the said C. C. Dalton and John W. Reynolds, have been, in pursuance of stipulation herein, duly agreed upon and appointed by said States of Washington and Oregon, respectively, by their respective attorneys, as Commissioners jointly to take the testimony of the witnesses in the above entitled cause and to certify the same jointly to this Honorable Court. That each of us before proceeding to take the testimony herein, duly took and subscribed an oath to support the Constitution of the United States and faithfully and impartially to discharge our duties as such commissioners, which oaths are herewith filed.

That the foregoing depositions of witnesses on behalf of the defendant were taken before us jointly as such Commissioners,
796 on oral interrogatories, between the hours of ten o'clock in the forenoon and four o'clock in the afternoon, at Portland, in Multnomah County, State of Oregon, on the dates following, respectively:

Deposition of Gelo F. Parker, on Thursday, September 13, 1906.
Deposition of John Service, on Thursday, September 13, 1906.
Deposition of A. L. Pease, on Thursday, September 13, 1906.
Deposition of H. Emken, on Friday, September 14th, 1906.
Deposition of J. W. Babbidge, on Friday, September 14, 1906.
Deposition of S. D. Adair, on Friday, September 14, 1906.
Deposition of John W. Welch, on Friday, September 14, 1906.
Deposition of George Kaboth, on Friday, September 14, 1906.
Deposition of W. A. Betts, on Friday, September 14, 1906.
Deposition of George Scoggin, on Friday, September 14, 1906.
Deposition of George Kaboth (recalled), Friday, September 14, 1906.
Deposition of W. H. Whitcome, on Friday, September 14, 1906.
Deposition of W. H. Patterson, on Saturday, September 15, 1906.

797 That said depositions and testimony so taken were reported in shorthand writing by John H. Pelletier, the shorthand re-

porter duly agreed upon, and appointed by the respective parties to said cause, to report said testimony, and were by said John H. Pelletier, under our direction, reduced to typewriting, and the certificate of the said John H. Pelletier as to the correctness thereof, is hereunto appended.

That before proceeding to report said testimony, said John H. Pelletier was by us duly sworn, to report and transcribe the same, truly, faithfully and correctly.

That before said testimony was taken, each of said witnesses was by us duly sworn to tell the truth, the whole truth and nothing but the truth.

That the reading and signing of said depositions by the respective witnesses was duly waived by stipulation of the parties hereunto, by their respective attorneys, which said stipulation is set forth in the record of said deposition.

That exhibits were introduced in evidence on the part of said defendant, and marked as follows, said marks being authenticated by our signatures as Commissioners, to-wit:

Oregon's Exhibit No. 14.

Oregon's Exhibit No. 15.

Oregon's Exhibit No. 16.

That the foregoing are all of the exhibits offered or introduced before us on the part of said defendant, and said exhibits,
798 Oregon's Exhibit No. 14, to No. 16, inclusive, are hereto attached, and made a part hereof.

That the foregoing is a true and complete transcript of the depositions and evidence taken before us on behalf of the defendant in the above entitled cause, and of the whole thereof, and of all objections made thereto, and of the stipulations entered into between the parties during the progress of the taking of the testimony on behalf of the defendant, and consists of pages numbered 297 to 419 of the record of testimony taken before us in said case.

In witness whereof, we have hereunto subscribed our names and affixed our notarial seals this 17th day of September, 1906, at The City of Portland, Multnomah County, in the State of Oregon.

[Seal C. C. Dalton, Notary Public, State of Washington. Commission expires July 9, 1910.]

C. C. DALTON,
Commissioner and Notary Public
for the State of Washington.

[Seal John W. Reynolds, Notary Public, State of Oregon.]

JOHN W. REYNOLDS,
Commissioner and Notary Public
for the State of Oregon.

799 And on the same day, towit, on the 5th day of November, A. D. 1906, certain exhibits were filed which, in accordance with the stipulation of the parties and order of court thereon, are not here reproduced.

FILED.
JAN 2 1908
JAMES H. McKENNEY

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, A. D. 1907.

STATE OF WASHINGTON,
Complainant,
v.
STATE OF OREGON,
Defendant.

No. 3 Orig.

BRIEF OF COMPLAINANT

JOHN D. ATKINSON,
Attorney General,
E. C. MACDONALD,
Assistant Attorney General,
SAMUEL H. PILES,
Solicitors for Complainant.

A. J. FALKNOR,
J. B. ALEXANDER,
Of Counsel.

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, A. D. 1907.

STATE OF WASHINGTON,
Complainant,

v.

STATE OF OREGON,
Defendant.

BRIEF OF COMPLAINANT

The complainant filed its bill of complaint in this court for the purpose of determining an existing controversy concerning the boundary line between the states of Washington and Oregon. The defendant appeared by answer and cross bill and issue was joined thereon. Proof having been taken by commisioners selected under a stipulation approved by the court, the cause is now submitted upon such proofs and the argument of counsel.

In the hope that it might be found useful to the court, we have taken the liberty of attaching to this brief a partial reproduction of complainant's exhibits, "H" and "I," which were introduced in evidence, and which show the boundary lines respectively claimed by the parties. The line in blue coloring on Exhibit "H" is that claimed by Oregon, while the black line marked "1905 Channel Line" denotes the boundary contended for by the complainant, and which is slightly different from the line as set forth in the bill of complaint.

The proofs will disclose the fact that there have been various channels in the Columbia river which have gradually, imperceptibly and continuously changed and shifted. There has been at no time such a change as to come within the definition of avulsion. The contention of the complainant is that the true boundary line is the varynig center or middle of that channel of the river which is best consti-

tuted and ordinarily used for the purposes of navigation, and this is the line which we have referred to as marked on Exhibit "H", "1905 Channel Line." The line claimed by the defendant commences at a point which is alleged to have been the middle of the North Ship channel of the river as it existed in 1859, (the year in which Oregon was admitted into the Union), and follows certain channels supposed to exist in that year throughout the portion of the river in controversy. Defendant denies that any change has or can occur in that boundary by variations in the channel or otherwise.

Oregon was admitted into the Union by an act of Congress approved Feb. 14, 1859. Section two of that act prescribed the boundary so far as is material to this controversy, as follows:

Commencing at "a point due west and opposite the middle of North Ship channel of the Columbia river; thence easterly, to and up the middle channel of said river, and, where it is divided by islands, up the middle of the widest channel thereof, to a point near Fort Walla Walla, etc."

Washington entered the Union by virtue of an act of Congress approved Feb. 22, 1889; its boundaries are described as follows:

Beginning at "*a point* in the Pacific ocean one marine league *due west* of *and oposite the middle* of the mouth *of the North Ship channel of the Columbia river, thence* running *easterly to and up the middle channel of said river and where it is divided by islands up the middle of the widest channel thereof*, to where the forty-sixth parallel of north latitude crosses said river," etc.

The description of the State of Washington as italicized coincides with the description of the boundary of the State of Oregon. It will be perceived from an examination of the boundary lines, as claimed by the parties hereto, that a great divergence of opinion exists. At some points in the river the lines as claimed are more than three miles apart. Between these lines there are located a large number of islands and sands, some of which are named in the bill of complaint, which are exceedingly valuable for fishing and other purposes. Both parties to the action claim jurisdiction and sovereignty over and ownership of these islands, and it is admitted by the pleadnigs that a controversy exists as to the boundary line. As will be disclosed by the evidence, Sand Island, one of the principal tracts of